No. 15-1975

IN THE
United States Court of Appeals for the Federal Circuit

IN RE: MARCEL VAN OS, FREDDY ALLEN ANZURES,
SCOTT FORSTALL, GREG CHRISTIE AND
IMRAN CHAUDHRI

On Appeal from the United States Patent
and Trademark Office
Patent Trial and Appeal Board No. 2013-004862
(Serial No. 12/364,470)

BRIEF FOR MARCEL VAN OS, FREDDY ALLEN ANZURES, SCOTT FORSTALL, GREG CHRISTIE AND IMRAN CHAUDHRI

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Patent Application No. 12/364,470: Claims 38 & 40

38. A portable electronic device including a graphical user interface, comprising:

a touch-sensitive display configured to display the graphical user interface;

a processor coupled to communicate with the touch-sensitive display; and

a machine-readable storage medium including a plurality of instructions that, when executed by the processor, cause the performing of operations including,

displaying a plurality of icons of the graphical user interface on the touch-sensitive display, the icons individually corresponding to applications to provide additional functionality through the portable electronic device;

detecting a first user touch on the touch-sensitive display, the first user touch of a first duration and at a location proximate a first icon of the plurality of icons;

A23-24.

40. A method of operating a portable electronic device including a graphical user interface implemented through a touch screen interface, comprising the acts of:

displaying a first plurality of icons of the graphical user interface on the touch-sensitive display;

detecting a first user touch on the touch-sensitive display, the first user touch of at least an established duration and at a first location proximate a first icon of the plurality of icons;

interpreting the detected first user touch as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location; and

in response to user movement of the touch on the touch screen from the first location proximate the first icon to a second location, moving the first icon from the first location to the second location.

A24.

CERTIFICATE OF INTEREST

Counsel for Appellants certifies the following:

1. We represent Marcel Van Os, Freddy Allen Anzures, Scott Forstall, Greg Christie, and Imran Chaudhri.

2. Apple Inc. is the name of the real party in interest.

3. Apple Inc. has no parent corporation. No publicly held company owns 10 percent or more of Apple Inc.'s stock.

4. The following law firms and partners or associates appeared for Apple Inc. in the trial court or agency or are expected to appear in this court:

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STATEMENT OF RELATED CASES

This appeal concerns a rejection by the Patent Trial and Appeal Board of the United States Patent and Trademark Office of a patent application submitted by several inventors at Apple Inc. (hereafter, collectively referred to as Apple).

Pursuant to Federal Rule of Appellate Procedure 47.5, counsel for Apple states that there has been no prior appeal from this proceeding in this or any other appellate court, and counsel is aware of no case that will be directly affected by the Court's decision in this case.

Counsel notes that *In re Lemay*, Case No. 15-1973 (Fed. Cir.), involves another patent application by some of the same Apple inventors that was rejected after the same PTAB proceeding.

INTRODUCTION

Not all user interfaces are usable. That is why Apple employs some of the most talented engineers in the world to work tirelessly at developing new and better ways for users to interact with their devices—buttons where and when you need them, gestures that feel exactly how they should, subtle sensory clues that guide you through your email, help you read a map, or get you onto the nearest wireless network.

The invention at issue in this appeal is a touchscreen user interface that the user herself can reconfigure to her liking. Specifically, the patent application teaches a way of reconfiguring the icons on the home screen of, most familiarly, an iPhone. You touch and hold on an icon, the icons wiggle, and you drag them where you want them. After all these years, this may seem second-nature. But it need not be this way—there are hundreds, even thousands of possible ways, some terrible, some passable, and a small few optimal. Back in 2005, when the reconfiguration interface here was developed, Apple's engineers were devising the optimal for a whole host of interactions in a mobile world still in infancy.

The Patent and Trademark Office recognizes that the patent law should incentivize these sorts of contributions. Indeed, the PTAB in this very case granted patent protection to some aspects of the interface reconfiguration taught in the patent application. Yet, in the space of a few paragraphs, it denied patent protection to four key claims in the application—represented by claims 38 and 40—finding that they are obvious. It did so by minimizing or ignoring the inventive aspects of the claims and by taking an enormously expansive view of the scope and content of the prior art. For several reasons, the PTAB decision should not stand.

First, the PTAB's unreasoned obviousness conclusion is erroneous on its face, because it fails even to make an obviousness determination as to the claims *as a whole*. The inventive combination in claim 38 assigns a simple user tap to the commonly used function of opening an app, but then assigns a similar tap-and-hold to the function of launching a mode in which the user can reconfigure the same icons. In other words, it takes one of the most basic of gestures on a touchscreen and gives two subtle variations on it two very different purposes. Claim 40, meanwhile, teaches that the sustained touch that launches

reconfiguration is also the beginning of the action that moves an icon. It thus assigns the very same touch a seamless, dual role.

The PTAB's cursory reasoning found both claims obvious based only on the conclusion that the prior art teaches or suggests icon reconfiguration launched by a sustained touch. But icon reconfiguration launched by a sustained touch is simply not all that claims 38 and 40 teach. The repurposing and dual-role aspects of those claims are their core. The PTAB erred by ignoring them.

Second, the prior art does not come close to teaching the combinations in claims 38 and 40 as a whole. In fact, the two pieces of art the PTAB invoked (Hawkins and Gillespie) do not even teach or suggest the sustained touch + icon reconfiguration to which the PTAB erroneously reduced claims 38 and 40. Both pieces of prior art teach totally different manners of shifting or replacing icons and totally different ways of making it happen. And anyway, the two elements of Gillespie that were the lynchpin of the PTAB's ruling came from different embodiments, with no suggestion of a reason to combine them. Certainly the PTAB did not identify one.

Third, the PTAB's obviousness methodology is a classic, prohibited hindsight analysis. It merely matched up the language in claims 38 and 40 with prior art references and declared in a single sentence that combining them would have been "intuitive" to one with skill in the art. A2064. This Court has repeatedly warned that working backwards from the claims instead of forwards from the prior art injects hindsight bias into the obviousness analysis. The PTAB fell into the hindsight trap, and for this reason too should be reversed.

And finally, for reasons explained at length in Apple's brief in *In re Lemay*, the PTAB's decision must at least be vacated because it is insufficiently reasoned and articulated.

JURISDICTION

This is an appeal from a final decision of the Patent Trial and Appeal Board of the United States Patent and Trademark Office. The Board issued its final decision on May 21, 2015. A1-10. Apple timely filed a notice of appeal on July 22, 2015, within the 60 day time limit set by 35 U.S.C. § 142 and 37 C.F.R. § 90.3. A2228-32. This Court therefore has jurisdiction over this appeal under 35 U.S.C. § 141(a) and 28 U.S.C. § 1295(a)(4)(A).

STATEMENT OF THE ISSUE

Apple's patent application teaches a touchscreen interface on a mobile device that permits a user to rearrange icons. The PTAB affirmed the examiner's rejection of four claims in the application as obvious. But neither the examiner nor the PTAB made a finding that the prior art teaches or suggests the central combination of elements disclosed in the claims. And for the combinations they did find obvious, they relied upon prior art that teaches entirely different means of reorganizing icons and upon references that were not directed at user-directed reorganization. Was the obviousness finding erroneous?

STATEMENT OF THE CASE

Mobile Devices Evolve To Respond To Touches, Pinches, Taps, And Swipes.

In 2005, Apple was on the brink of releasing a revolutionary series of products. Its engineers had solved a puzzle that would unlock the power of mobile computing. It was already possible to cram a computer's functionality into a handheld device, but "it [was] a significant challenge to design a user interface that allow[ed] users to easily interact with the device." A2343 [0004]. Miniaturized keyboards sufficed for entering text, but to perform other functions "[s]ome

portable electronic devices (*e.g.*, mobile phones) … resorted to adding more pushbuttons, overloading the functions of pushbuttons, or using complex menu systems to allow a user to access, store, and manipulate data." *Id.* These "inflexible" user interfaces were holding mobile devices back. A2343 [0005].

The answer was an ultra-sensitive but durable touchscreen, first developed by Apple. *See generally Apple Inc. v. Samsung Elecs. Co.*, No. 14-1802, 2015 WL 5449721, at *1 (Fed. Cir. Sept. 17, 2015) ("After its release, reviewers praised a number of features on the iPhone, including its multitouch screen, software, ease of use, and overall user experience."); *Apple Inc. v. ITC*, 725 F.3d 1356, 1368 (Fed. Cir. 2013) (Reyna, J., dissenting in part). That touchscreen, built into the first generation iPhone and iPod touch in 2007, forever changed the way we operate mobile devices.

Swiping, tapping, pinching, and pressing touchscreens now feels second-nature. *Id.* But the gestural language we all now speak fluently is hardly intrinsic to an iPhone's operation. Apple's engineers had to devise it. And because Apple's were the first touchscreens of their kind to hit the market, the engineers had to figure out from scratch how

users might like to peck out emails on subway cars, check stock quotes in the elevator, or record a baby's first words in one hand while holding him in another.[1]

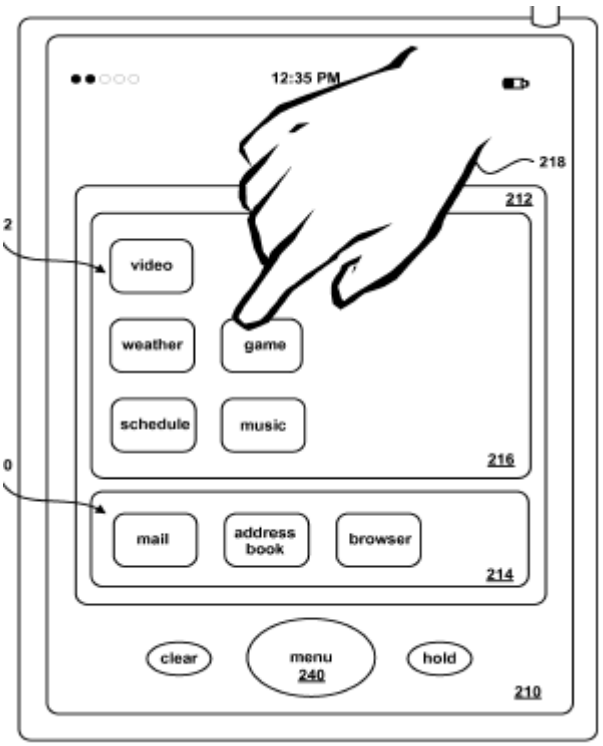
Devising a user interface and the semantics to interact with it is a highly complex endeavor. *See, e.g.*, A498-503 (discussing considerations underlying configuration of web content); A731-55 (discussing use of animation techniques in user interfaces); A816-25 (discussing use of physics simulation in user interfaces). Apple's engineers had to take account of technological capabilities. (What gestures can be detected?) They had to take account of various human factors, like user capabilities, conditioning, or proclivities in various mobile contexts. (What can users remember? How precisely do their fingers move? What gestures can they perform with one hand? What gestures will feel natural?) And the engineers had to answer these questions not just for

[1] The actions necessary to interact with a mobile device were just one piece of the interface Apple engineers had to develop. Another example is the visual presentation of various types of content on the screen—a remarkably challenging endeavor given that the world of content was dramatically expanding while screen size was shrinking. Apple engineers' work on this visual interface is the subject of *In re Lemay*, the video access appeal.

one possible action, but for the entire range of functions on a handheld computer, and in a way that held together as a whole.

Apple Engineers Develop Innovative Ways To Reorganize Icons In A Graphical User Interface.

One of the many mobile device functions that needed to be mapped to gestures was a user's reorganization of the icons on the mobile device screen. Mobile devices like the iPhone or iPod are capable of running many different applications (or "apps"). A typical iPhone, for example, will have an alarm clock app, an app that provides weather reports, an email app, and so forth. *E.g.*, A2336. As depicted in the two graphics below, these apps are represented by icons on the "home screen," similar to how applications and files are represented by icons on your home computer's desktop:



A2335

A607

A user might want to rearrange the icons into different configurations because, for example, she uses her scheduling app frequently and would like to place it in the most convenient location, or because grouping similar apps together makes them easier to find. Although previous user interfaces could be configured by users, "the process of modifying [them] [was] … cumbersome and complicated." A2343 [0006]. The "required behaviors" were often "counter intuitive" and the "corresponding indicators"—the on-screen results that prompt or guide users through the process—were "difficult to understand." *Id.*

"There [was] a need for a more transparent and intuitive user interface[] for portable devices that enable a user to configure the user interface." A2343 [0007]

A team of inventors at Apple delivered. In 2006, they filed an initial patent application disclosing a portable electronic device that allowed users to reconfigure the on-screen icons in various ways. This resulted in U.S. Patent Number 7,509,588. The patent mainly claims a method for displaying and reconfiguring icons on a touchscreen and an electronic device capable of performing that method. *See* U.S. Patent No. 7,509,588 cols. 10-12 (issued Mar. 3, 2009). In February 2009, the inventors filed the continuation application (the "Application" or "Icon Reconfiguration Application") at issue in this appeal. A26.[2]

The invention disclosed in this application is a touchscreen-controlled portable electronic device capable of displaying and reconfiguring icons. Generally stated, the icon reconfiguration the Application discloses has the following four components: (1) an "interface reconfiguration process" or "mode"; (2) a set user action that, when detected by the device, initiates that process or mode; (3) a way of

[2] The patent application (A2333-49) and amended claims (A17-25) are included in the addendum to this brief.

telling the user that the process or mode has been initiated and that icons can now be reconfigured; and (4) a set user action or actions that, once the process or mode has been initiated, move an icon to another position on the screen. A2343 [0004-0015].

The claims that were chiefly in issue before the Examiner were claims 1, 38, and 40—the latter two of which are at issue in this appeal. To illustrate how the invention in the Application works, we begin with claim 1 (with emphasis on the key components enumerated above):

> 1. A portable electronic device, comprising:
>
> a touch-sensitive display;
>
> one or more processors;
>
> memory; and
>
> one or more programs … including instructions for:
>
> displaying a first plurality of icons in a first region on the touch-sensitive display;
>
> *detecting a first predefined user action* comprising a *sustained touch*, with respect to the touch-sensitive display at a first location on a first icon on the display, *for initiating a predefined user interface reconfiguration process*;
>
> *simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, …*
>
> and
>
> *detecting movement of the touch from the first location on the display to a second location on the display at which a second icon is located, and in response to the detected movement, moving the first icon to the second location.*

A17 (emphasis added).

In lay terms, claim 1 contemplates that an iPhone user wanting to reconfigure icons will touch the screen for a certain length of time ("sustained touch"); that this will trigger a reconfiguration mode in which the icons shake or wiggle ("multiple icons" that "vary[] positions"), indicating to the user that she can now reconfigure; and that the user can then drag the icon somewhere else ("detecting movement … from the first location … to a second location"). *Id.*

At issue in this appeal are claims 38 and 40. Relevant here, claim 38 teaches an icon reconfiguration interface with the following steps (again with salient text emphasized):

> detecting a *first user touch* on the touch-sensitive display, the first user touch of a *first duration* and at a location proximate a first icon of the plurality of icons;
>
> interpreting the detected first user touch as an input to initiate the application corresponding to that first icon;
>
> detecting a *second user touch* on the touch-sensitive display, the second user touch of a *second duration*, *longer than the first duration*, and at a location proximate a second icon of the plurality of icons;
>
> interpreting the detected second, longer, user touch as an input initiating *an interface reconfiguration mode*; and
>
> in response to subsequent user movement on the touch screen from the location proximate the second icon to a third location,

> moving the second icon from the second location to the third location.

A23-24 (emphasis added). Claim 38 thus claims a touchscreen device that opens an app when an icon is tapped, but that "initiate[s] an interface reconfiguration mode" when touched for a particular, "longer" duration. In other words, a touch serves either of two purposes—either launching apps or reconfiguring the screen entirely—depending on how long the user sustains it.

Claim 40 is a method claim. Relevant here, it claims:

> detecting a first user touch … of at least an established duration …;
>
> interpreting the detected first user touch as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location.

A24. Claim 40 thus teaches that the same action that initiates reconfiguration also serves seamlessly as the starting action for the user reconfiguration itself. Rather than employing two separate actions—one to enter reconfiguration mode, another to reconfigure—the step is integrated. A user touches, sustains, and moves in one integrated gesture, perhaps requiring more facility and grace on the user's part, but also eliminating the extra step.

The Examiner Reads The Prior Art To Render Several Claims Obvious.

After several rounds of non-final rejections and claim amendments, the examiner rejected as obvious claims 1-3, 5, 6, 8, 9, 11-25, and 31-41, of which claims 1, 38, and 40 are representative. A2050. He found two pieces of prior art relevant to each claim: (1) U.S. Patent No. 7,231,229 ("Hawkins"), A2275-303; and (2) Pub. No. US 2002/0191029 ("Gillespie"), A2304-32.

Hawkins, filed at the beginning of 2004, claimed a "communication device interface" that displays a "context-sensitive" menu that allows a telephone user to select a mode of communication for contacting someone. A2275 [57]. The invention is targeted at "any communication device [e.g., phone] that provides user-activated speed-dial buttons." A2294 col. 3:35-38. The phone does not have to have a touchscreen; the speed-dial button could be "physical form, 'soft' form, … or … some other mechanism." A2294 col. 3:37-38. Basically, it works like this: A phone user scrolls through her contacts until she gets to the person she wants to contact, then presses the "speed-dial" button; in response, the phone displays a menu that prompts the user to select

from several contact options, e.g., phone call, text message, or email. A2294 col. 3:5-24.

Gillespie, filed in April 2002, claimed a "graphical user interface" on a "touch screen." A2304 [57]. The notion was to enhance the blank touch pad that is typically used on a laptop. Usually that touch pad acts as a substitute for a mouse, A2321 [0043], accepting user inputs that move the cursor on the main display or click on things on the screen, A2305 fig. 1; A2319 [0003]. The invention in Gillespie aimed to add functionality to that touch pad. It placed icons on the touch pad that corresponded to various functions—a calculator, for example, or a computer's volume control:

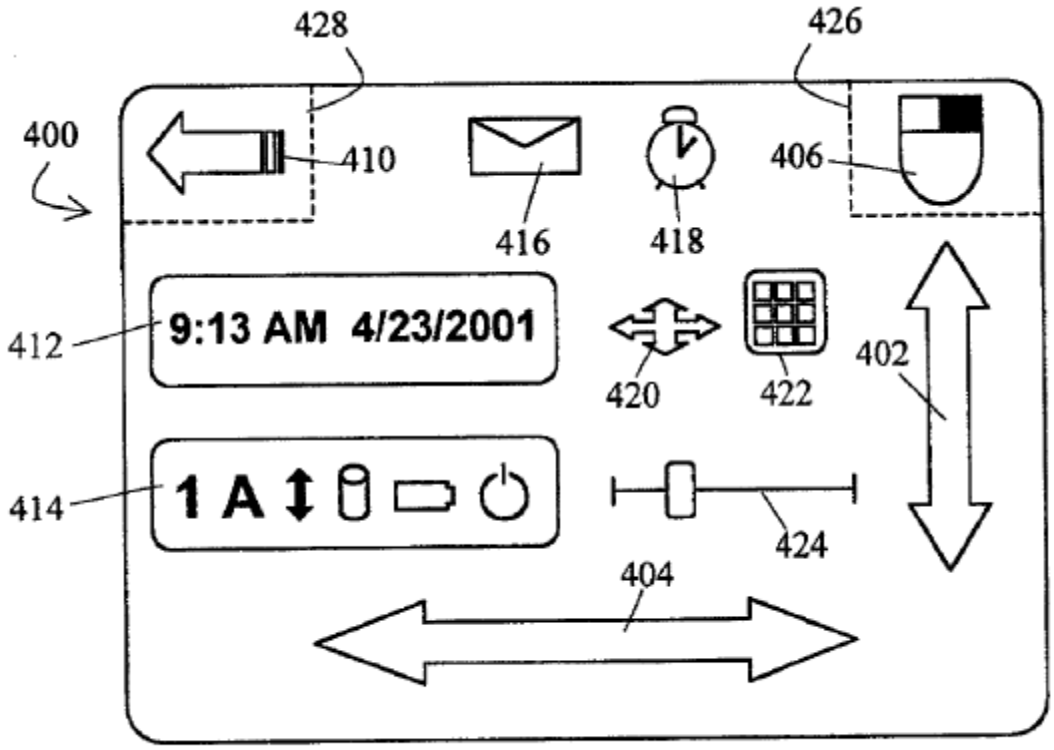


Figure 4

A2306 fig. 4. The various embodiments discussed in the patent suggested ways of activating and using these icons.

Although neither Hawkins nor Gillespie contemplates the touchscreen of a handheld device, the examiner nonetheless thought that they rendered several claims in the Icon Reconfiguration Application obvious. To reach this conclusion, he identified statements in certain individual embodiments in Hawkins and Gillespie that referenced the possibility of reconfiguring things on the screen. He then

laid out the relevant claim language in the Application, and attempted to map these statements in Hawkins and Gillespie onto each limitation.

In Hawkins—the speed-dial invention—the examiner focused on an embodiment in which a user can "select[] an 'Edit Favorites Pages' command from an onscreen menu," A2301 col. 17:26-46, which would then allow "[t]he user [to] rearrange buttons by dragging them," A2053.

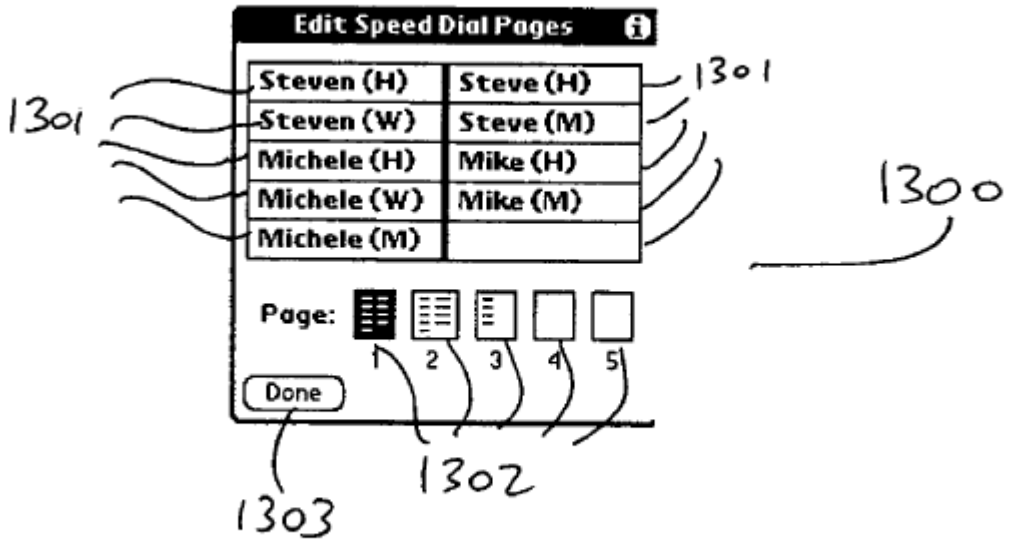


FIG. 13

A2290 fig. 13. He thought that this taught the elements in claims 1, 38, and 40 concerning "initiating a predefined user interface reconfiguration process" or "mode" and the dragging of buttons on the screen to rearrange them. A2052; A2062; A2064.

The examiner acknowledged that "Hawkins does not explicitly disclose … that the first predefined user action consists of a sustained touch on the display." A2053; A2063. For this, he looked to two separate embodiments in Gillespie—the laptop touch pad invention. The first taught that the laptop touch pad could have both an "activated" and "unactivated" state, and that the icons displayed on the touch pad could be different or differently arranged depending on the state. A2323 [0061]. The other, separate embodiment taught a way of activating an *individual* icon *for use* by touching it "in a special way," like "hovering … over an icon" or "holding the finger steady over [it] for a given duration." A2324 [0071]. The examiner combined these embodiments to teach reconfiguration activated by a sustained touch, as contained in claims 1, 38, and 40. A2053-54; A2063; A2064.

Relevant only to claim 1, the examiner acknowledged that Hawkins and Gillespie did not teach the icon "wiggle" that indicated to a user that a reconfiguration mode had been triggered, A2053, but tried to compensate for this deficit with a third piece of prior art, Krishnan, U.S. Patent No. 6,278,454 (filed Sept. 24, 1998). A2251-74; *see* A2054. Although Krishnan had nothing to do with reconfiguration of an on-

screen user interface—it was directed to an operator monitoring the status of phone calls—it did teach that symbols could be "animated to indicate a state." A2054 (citing '454 Patent, col. 7:3-12). The examiner thought this was enough.

Thus, the examiner concluded that claim 1 was obvious over Hawkins in light of Gillespie and Krishnan, and that claims 38 and 40 were obvious in light of Hawkins and Gillespie alone.

The PTAB Reverses As To One Group Of Claims, But Finds That Two Are Obvious Over The Prior Art.

The PTAB reversed in part and affirmed in part. A1-10. It held that the combination of Hawkins, Gillespie, and Krishnan did not teach or suggest all of the limitations in claim 1. The PTAB focused on claim 1's "wiggling" limitation and Krishnan: "[A]lthough Krishnan describes that 'icons … can also be animated to indicate a state,' we agree with Appellants that the cited disclosure does not teach or suggest 'simultaneously varying multiple icons **in response to detecting a predefined user action for initiating a user interface reconfiguration process**." A7 (internal citations omitted; emphasis in original). This led to reversal on claim 1, as well as independent claims 11, 16, and 21, and all of their dependent claims. A7-8.

But the PTAB affirmed on claims 38 and 40 (and their dependents, 39 and 41). It found that "the Examiner did not err by combining Gillespie's teachings of a user touch of a longer duration, *see* Gillespie, ¶ 71, and of a reconfiguration process, *see id.* ¶ 61, with Hawkins' disclosure of an interface reconfiguration mode (Hawkins 17:44-54)." A9 (parentheses omitted). And it found no error in the examiner's conclusion that the "*combined* teachings" of the prior art "*would have suggested* to one of ordinary skill in the art" the limitations of claims 38 and 40. A8 (emphasis in original).

SUMMARY OF THE ARGUMENT

I. Virtually every invention is a combination of old elements. The combinations that are worthy of patent protection assemble those elements in an inventive way, so that they add up to more than the sum of their parts. Claims 38 and 40 disclose such inventive combinations. The central inventive combination in claim 38 assigns a simple user touch to the common function of opening an app, but then assigns the same basic action—held for a longer duration—to the function of launching an icon reconfiguration mode. This repurposing of the most basic of gestures on a touchscreen is hardly obvious. Indeed, it is one of

hundreds if not thousands of possible combinations. By pairing the gestures and functions as they did, Apple's engineers created a combination that would surprise one with skill in the art.

The same is true of claim 40. Claim 40 teaches that the same sustained touch that initiates an icon reconfiguration mode is also the beginning of the action that moves the icon itself. Thus, claim 40 assigns to a single action a seamless, dual role. Again, there are myriad possible combinations—some bad, some passable, and a few optimal. Finding the optimal ones is no small feat, but Apple's engineers achieved it with claim 40.

II. In finding claims 38 and 40 obvious, the PTAB (endorsing the examiner's reasoning) relied primarily on Gillespie. Drawing from two separate embodiments, the PTAB found that Gillespie taught both (a) a sustained touch that activates a single icon and (b) separate display modes (activated by a separate button) with different interface configurations. Then the PTAB simply stated that it would have been "intuitive" to one skilled in the art to use the sustained touch to toggle between the two display modes. This scant analysis is erroneous in three respects.

A. To start, the PTAB's analysis is inadequate on its face, because it fails to look at the invention *as a whole*. Its analysis found merely that the prior art teaches or suggests a sustained touch that launches icon reconfiguration. But there is far more to both claims than that. Claim 38 teaches the repurposing discussed above through limitations involving a "first user touch" and a "second user touch [of longer duration]." By focusing only on the second, sustained user touch, the PTAB ignored the central inventive aspect of claim 38: The relationship *between* the two touches in the user interface.

The same error dooms the PTAB's analysis on claim 40. Claim 40 teaches more than a sustained touch that launches icon reconfiguration. Its dual-role combination is the essence of the invention, and the PTAB erred by ignoring it.

B. In any event, Hawkins and Gillespie do not even teach or suggest the mere sustained touch icon reconfiguration the PTAB purported to find there. To the contrary, Hawkins and Gillespie both teach completely different ways of entering an interface reconfiguration mode, involving separate menu buttons and control panels.

The PTAB largely looked to two paragraphs in Gillespie, from entirely different embodiments, to try to fill this gap, but they do not do the trick. One of these paragraphs suggests the use of a sustained touch to activate a *single* icon; the other teaches separate default display modes, activated with a separate button, that have different configurations of icons. But toggling default configurations of icons is not an "icon reconfiguration mode," and in any event, nothing suggests in any way pairing it with a sustained touch, let alone creating an overall interface with the repurposing and dual-role features disclosed by claims 38 and 40.

C. In light of the above errors, and in the absence of any specific finding (other than the word "intuitive") as to why one skilled in the art would have found claims 38 and 40 obvious, all that remains of the PTAB's analysis is hindsight. This Court has repeatedly admonished that the obviousness determination must start with the prior art and proceed forwards, not with the claim elements, using them as a roadmap to an obviousness determination. Yet that is precisely what the PTAB did here.

III. Finally, the PTAB's decision must be vacated because it is unsupported by reasoned analysis. It is a fundamental principle of agency doctrine that all decision must be based on reasoned decisionmaking. This promotes sound results, and is particularly important in the iterative process of patent prosecution. The PTAB's analysis in this case and *In re Lemay* fell short of these requirements.

This Court should reverse.

STANDARD OF REVIEW

Obviousness is a question of law reviewed de novo. *In re NTP, Inc.*, 654 F.3d 1279, 1297 (Fed. Cir. 2011). Underlying factual questions—like the presence of a specific element in a piece of prior art—are reviewed for substantial evidence. *Id.* at 1298 (concluding that "the Board's findings regarding the content of the references are supported by substantial evidence"). The ultimate finding that a particular combination of elements would be obvious to one with skill in the art is one of law to which this Court owes no deference. *Id.*

ARGUMENT

I. The Unique User-Directed Icon Reconfiguration Interface Disclosed In The Claims Is Not Obvious.

"Virtually all inventions are combinations of old elements." *Princeton Biochems., Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed. Cir. 2005) (quoting *Envt'l Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698 (Fed. Cir. 1983)). For that reason, the obviousness inquiry recognizes that an invention is more than the sum of its parts. In any obviousness inquiry, then, the question is whether the invention "*as a whole* would have been obvious." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 399 (2007) (emphasis added); *Princeton Biochems.*, 411 F.3d at 1337; *In re De Blauwe*, 736 F.2d 699, 706 (Fed. Cir. 1984). Considered as a whole, the innovative user interface at issue here would not have been obvious. Claims 38 and 40 both contain combinations of elements that repurpose user gestures or assign them dual roles in a way that is unexpected—if not counterintuitive—and fundamentally different from what came before.

A. Considered as a whole, claim 38 is not obvious because it repurposes the same basic touch used to open an app for the one that initiates icon reconfiguration.

Claim 38's central attribute is this: It calls for a touchscreen to detect the same basic action—two touches, but for different durations—and to assign to that action very different results. A "first user touch" for "a first duration" "initiate[s] the application corresponding to" the icon the user touches. A23. This is familiar to anyone who has ever used an iPhone—tap an icon to launch the app. *Id.* The "second user touch" of "second duration, longer than the first duration" will "initiat[e] an interface reconfiguration mode." A24. That is, a slightly longer touch, instead of launching an app, effectively unlocks the icons on the screen, allowing the user to rearrange them. *Id.* Thus, the very same basic gesture, performed for a slightly longer time, accomplishes two very different functions. The touch gesture, in other words, is *repurposed*.

It may be tempting to dismiss this combination as simplistic or arbitrary, but case law from this Court and elsewhere has repeatedly cautioned against doing so. As Judge Hand put it, "[n]othing is easier in patent litigation than to confuse a trifling … change with the

ingenuity demanded for its discovery." *Refractolite Corp. v. Prismo Holding Corp.*, 117 F.2d 806, 807 (2d Cir. 1941). Just because something looks like a "minor advance" does not mean that it is an "obvious one." *Intel Corp. v. ITC*, 946 F.2d 821, 835 (Fed. Cir. 1991). Simple does not mean obvious.

Consider, for example, *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000). The invention there was directed to "providing [the] optimal temperature control for an injection molding method." *Id.* at 1367. A key aspect of the invention was "the use of a single temperature sensor to control a plurality of flow control valves." *Id.* at 1370. The invention did not, of course, invent temperature sensors or flow control valves, nor was it the first to pair those two elements in some way. And, indeed, this Court recognized that "[t]he idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept." *Id.* at 1371. But this did not mean the invention was obvious. And because the examiner and the PTAB in that case failed to point to "a specific understanding or principle … that would have motivated one with no knowledge of

Kotzab's invention to make the combination in the manner claimed," their finding of obviousness had to be reversed. *Id.*

The icon reconfiguration invention at issue in this case is similarly nonobvious, even though its combination of elements may seem simple in retrospect. To understand this, one must consider the vast array of options the engineers *could have* selected, along with the considerations that informed their decision not to. *Ortho-McNeil Pharm., Inc. v. Mylan Labs, Inc.*, 520 F.3d 1358, 1364 (Fed. Cir. 2008) (noting relevance of "number and complexity of the alternatives"). One option for reconfiguration, for example, would be to place a "Reconfigure Home Screen Icons" option within one of the phone's menus. Perhaps there is some appeal to this: With this solution, there would be no risk at all of a distracted or clumsy user accidentally entering reconfiguration mode and unwittingly scattering icons into new arrangements. But, as the Application explained, it would also require "complicated key sequences and menu hierarchies that must be memorized by the user." A2343 [0004].

Alternatively, a device could be outfitted with a "physical pushbutton[]." A2343 [0005]. But this approach the Application

rejected as "inflexible." *Id.* One could imagine a touchscreen programmed to recognize when a user draws the letter "R"—for "Reconfigure"—on the screen. The problem there is that it might be difficult for a user to render an accurate enough "R" while holding her phone in just one hand. Or maybe none of this is necessary, and an interface could simply permit the user to drag an icon from one place or another, regardless of the duration of the initial touch; simple enough, perhaps, but here the risk of an accidental rearrangement is likely too great, as is unintentional activation of an application. And so forth. The point is that this is not an instance in which there is a "finite number of identified, predictable solutions [to the problem]," *KSR*, 550 U.S. at 421. There are hundreds, if not thousands, of possible combinations of gestures and functions, and different ways to assign and reassign each to each other.

For someone skilled in the art, finding the best combination is not just a matter of doing what's "intuitive"—as, judging by the PTAB's and the examiner's conclusory analysis, they seem to have thought, *infra* 35, 45-46. It requires careful consideration of a host of human and technological elements to make a breakthrough. *Supra* 7-8. For

example, one scholarly paper in the record below, presented at a conference on computer-human interaction, explains how the "current virtual desktops" on personal computers do not allow users to arrange items to "indicate urgency" or "pile[]" them as we would do with documents on our real desktops. A816 (Anand Agarawala & Ravin Balakrishnan, *Keepin' it Real: Pushing the Desktop Metaphor with Physics, Piles and the Pen*, CHI 2006 Proceedings, 1283 (April 2006)). So the authors propose a solution that seeks to "leverage [the] user's spatial memory and knowledge of how things move physically in the real world" through "[a] physics simulator [that] allows objects to be dragged and tossed around" the screen. A816. This is not something an engineer simply intuits.

Indeed, if anything, the invention Apple's inventors settled on in this case turns out to be just the sort of *counter*intuitive combination that the law recognizes as nonobvious. *See generally KSR*, 550 U.S. at 416-17. A touch on a touchscreen is perhaps the most basic user gesture possible, so it is natural to assign it a basic function like launching an app. That element, considered alone, may be mundane. But it is not at all clear that a user would take to using the same

gesture to launch a mode allowing it to reconfigure icons. Indeed, there can be significant drawbacks to piling very different functionality on the same type of gesture—just imagine if your car's throttle and brake also controlled the volume of the radio. So a person skilled in the art would have been surprised to learn that using a very similar touch to do two very different things would actually improve user accessibility without risking confusion. *Cf. In re Glaug*, 283 F.3d 1335 (Fed. Cir. 2002) (finding improvement in elastic waistband for training pants nonobvious because "a person of ordinary skill in the relevant art would have found [it] surprising or unexpected" (quoting *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995)). The inventors, however, realized that the "elements worked together in an unexpected and fruitful manner," *KSR*, 550 U.S. at 416, providing an innovative way to perform an important function on a mobile device.

All of this is particularly salient for an invention like this one, which addresses a brand new problem in a brand new context. Apple's engineers were not reacting to a world in which much was known about how users interact with mobile devices. They were creating that world. *Supra* 5-8. Of the myriad options, Apple's inventors settled on the

repurposing solution here. That work should be incentivized with patent protection.

B. Considered as a whole, claim 40 is not obvious because it assigns a dual role to the same user action.

Much the same is true of claim 40. Like claim 38, claim 40 is imbued with a simple-but-remarkable insight: It assigns the same action a *dual role*. The relevant limitation in claim 40 provides for "interpreting [a] detected first user touch [of at least an established duration] as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location." A24. A user must therefore understand a seamless behavior. She must know to activate the icon reconfiguration mode, understand that the mode has been entered, and then move directly into reconfiguring icons without any further action.

To accomplish this, claim 40 treats the same sustained touch that initiates the user-directed reconfiguration mode as the beginning of the gesture that accomplishes the reconfiguration. In other words, it gives literally the same *action* a seamless, dual role in reconfiguring an icon.

Once again, it need not be this way. A clumsier interface might employ two different actions to accomplish the same thing; one action to

initiate a reconfiguration mode—a menu button, say, or a physical pushbutton—and then require a "first user touch" on the screen to begin the movement of the icon to a new location. A more accident-prone interface might simply allow a user to drag an icon after a touch of any duration. Or perhaps two icons could be switched by simultaneously touching each and dragging them to the other's space. Instead, Apple's engineers opted for a method requiring a sustained touch to unlock an icon, but allowing the user to proceed from there to move the icon elsewhere. This decision—particularly when understood within the larger context of the gestural language Apple's engineers were creating—resulted in an innovation worthy of patent protection.

II. The PTAB Erred By Failing To Consider The Invention As A Whole, Misreading The Prior Art, And Improperly Relying On Hindsight To Find The Claims Obvious.

The PTAB nevertheless found claims 38 and 40 obvious over two prior art references, Hawkins and Gillespie. Its analysis, largely echoing the examiner, turned almost exclusively on Gillespie. Drawing from two separate embodiments, the PTAB found that Gillespie taught both (a) a sustained touch that activates a single icon and (b) separate display modes (activated by a separate button) with different interface

configurations. Then the PTAB simply stated that it would have been "intuitive" to one in the prior art (even though it wasn't to Gillespie) to use the sustained touch to toggle between the two display modes. This analysis was erroneous in three respects.

First, the PTAB never made the required finding of obviousness based on the invention as a whole, ignoring the repurposing and dual-role aspects discussed above. *Infra* § II.A. Second, the prior art does not teach or suggest the combinations of elements the PTAB *did* find, let alone the crucial ones it neglected to evaluate. *Infra* § II.B. And third, after those errors are removed, all that remains is an obviousness conclusion that can only be the result of reliance on prohibited "hindsight reconstruction by using 'the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit,'" *In re NTP*, 654 F.3d at 1299 (quoting *Grain Processing Corp. v. Am.-Maize Prods. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988)). *Infra* § II.C. Each of these is reversible error.

A. The PTAB's analysis fails on its face because it failed to find that the invention as a whole is obvious.

The PTAB committed a very basic error: It never actually found that the most important inventive combinations disclosed by claims 38 and 40 were obvious. To be sure, both found that the prior art taught or suggested a combination of *some* elements, a conclusion that is wrong, and that we take up *infra* § B. But even if it passed its exam on the prior art, the PTAB would get an Incomplete on the entire course, because it failed to consider the repurposing and dual-role aspects of the claims. Those aspects are fundamental to the inventions. Simply put, the PTAB missed them.

The PTAB's analysis tracked the examiner's. On claim 38, it proceeded as follows. First, it recited each of the limitations in the claim—the "first user touch," "interface reconfiguration mode," "second user touch of a second duration," and so forth. A2061-63. Next, it purported to pair prior art references in Hawkins or Gillespie with each of these elements, finding, for example, that Gillespie taught a "steady" touch that mapped onto claim 38's sustained touch. *Id.* Finally, it concluded:

> It would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Hawkins of initiating a mode for reconfiguring the positions of icons displayed on a touch-sensitive display by dragging the icons to a new position with the teachings of Gillespie of visually indicating to a user on a display when a predefined user interface reconfiguration mode has been entered into by the user by sustaining a touch on the user interface. *One of ordinary skill in the art would have recognized that Gillespie's technique of entering a user interface reconfiguration mode in response to a user sustaining a touch in proximity to an icon displayed on the touchscreen would be an intuitive way for users of Hawkins' device to enter into the editing mode in which they could rearrange the icons corresponding to applications on the interface.*

A2064 (emphasis added). That was it—and the second, emphasized sentence was all the PTAB (or the examiner) ever said about combining gesture with function in claim 38. Both then applied the same analysis to claim 40 (without discussion). A8-9 (PTAB); A2064 (examiner).

This analysis "is simply inadequate on its face." *In re Thrift*, 298 F.3d 1357, 1366 (Fed. Cir. 2002). At most, a finding that "sustaining a touch … to enter into the editing mode," A2064, combines only the second set of detecting and interpreting steps in claim 38—the ones involving the "second, longer user touch," A23-24. But the invention is more than just a sustained touch that launches reconfiguration. The entire point of claim 38 is that the touchscreen also detects a *first user*

touch that is similar, but is interpreted to do something completely different (launch an app) than the second user touch. The PTAB did not analyze whether the prior art teaches or suggests a "*first* touch" and a "*second* touch," ignoring claim 38's combination of two touches mapped onto two different functions. It thus ignored the very essence of "*the invention as a whole*." *Grain Processing*, 840 F.2d at 907 (emphasis added).

The same is true of claim 40. The essence of claim 40 is not merely that a sustained touch launches icon reconfiguration. It is that this same touch also starts the gesture of actually moving an icon. The PTAB's analysis thus only captures a part of the key interpreting step in claim 40, missing the important limitation that "in the absence of a further user input allow[s] movement of at least the first icon from the first location." A24. It never finds that the dual-role aspect of claim 40 is obvious at all.

That the PTAB applied the exact same analysis to claim 40 as it did to claim 38 only underscores this oversight. Claim 40 and claim 38 teach different combinations of elements, and thus different aspects of the reconfiguration interface. *Supra* § A. So how could the same

analysis as to a sustained touch possibly render both obvious in one fell swoop? Only if one ignores the different inventive aspects of the claims—that is, their different combinations—could the identical analysis possibly apply. Just as with claim 38's repurposing, claim 40's dual role is precisely the inventive aspect of that claim that the PTAB should have been focused on.

The PTAB violated the cardinal rule that "[t]he court must view the claimed invention *as a whole*." *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 796 F.2d 443, 449 (Fed. Cir. 1986). As a result, there simply "was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [the] invention to make the combination in the manner claimed." *In re Kotzab*, 217 F.3d at 1371. These failings warrant reversal.

B. The prior art does not teach or suggest the combinations in the claims.

In any event, had the PTAB looked for the invention as a whole in the prior art, it would not have found it. Indeed, even the conclusion that mere sustained touch reconfiguration—without the repurposing or dual role—is taught or suggested by the prior art is wrong. The PTO

bears the burden of showing "how the prior art references, either alone or in combination, teach or suggest the claimed invention." *In re Bell*, 991 F.2d 781, 783 (Fed. Cir. 1993); *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Hawkins and Gillespie, the only art the PTAB and the examiner relied upon, do not come close to carrying this burden.

To begin with, both Hawkins and Gillespie teach completely different ways of entering interface reconfiguration—different both from each other and from claims 38 and 40. Hawkins teaches one embodiment in which the user selects an "'Edit Favorites Button' from an onscreen menu," which brings up a "dialog box for performing button configuration." A2299 col. 13:50-53. In another embodiment, "a user can rearrange buttons by dragging the button from one location to another, or by selecting a command for rearranging or configuring button pages." A2299 col. 13:54-57. Gillespie, meanwhile, acknowledges that its illustration of icons might not be the ideal arrangement, and so teaches that "it may be advantageous to allow the user to select which icons are present and to rearrange the icons, *possibly using a software control panel*." A2322 [0058] (emphasis

added). So neither Hawkins nor Gillespie even suggest icon reconfiguration initiated by a touch.

In finding otherwise, the PTAB looked elsewhere in Gillespie. (The examiner had acknowledged that Hawkins did not teach such a combination, and the PTAB did not suggest to the contrary. A2063.) Its analysis relied principally on paragraphs 61 and 71. Paragraph 61 teaches an embodiment in which the entire touch pad on the laptop can have an "activated and unactivated state." A2323 [0061]. These states can have different sets of icons, or icons in one state or another could be "removed or rearranged." *Id.* The idea behind this, paragraph 61 and its accompanying figures make clear, is to "reduce clutter" and highlight icons that are "most useful when activated." *Id.* For example, the "unactivated state" of the touch pad might display the time and date prominently in the center, but move it to the side or eliminate it entirely in the activated state to better allow a user to look at the touch pad and operate, say, an icon that controls music playback.

Paragraph 71, meanwhile, teaches an entirely different embodiment regarding not an "activated" and "unactivated" state for the touch pad, but for *individual icons* on the touch pad. This, again, is

the embodiment that teaches the activation of a particular icon by a steady touch, and it has nothing to do with the arrangement of icons. The PTAB, following the examiner's lead, put the two embodiments together to find an "icon reconfiguration mode" (presumably paragraph 61's activated and unactivated states) and a sustained touch entering that mode (the "steady" touch of paragraph 71).

Paragraphs 61 and 71 of Gillespie do not fill the void. First, paragraph 61's brand of icon reconfiguration is a far cry from the user-directed reconfiguration interface at issue in the Application. At best, paragraph 61 teaches two default states between which a user can toggle. It suggests, for example, that in the activated state, icon 414 below might be moved away or replaced with icons like 420 and 422, which could be more useful:

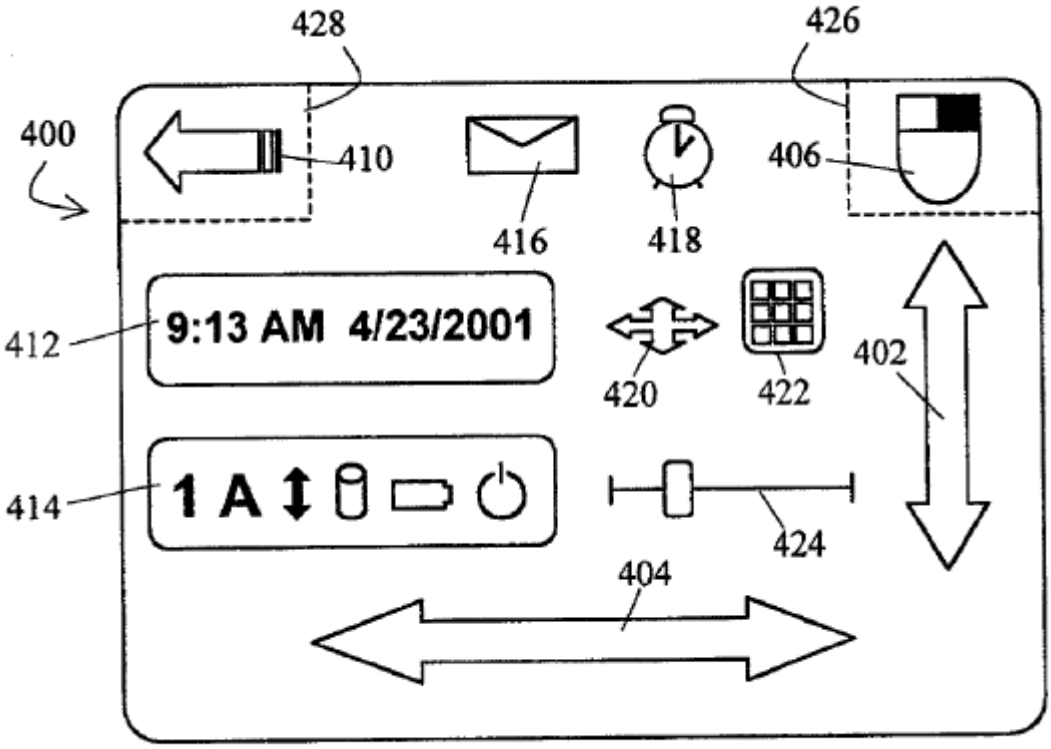


Figure 4

A2306 fig. 4. But it does not teach or suggest a mode in which icons are effectively unlocked, permitting users to drag them to a new location. Reading paragraph 61 as an icon reconfiguration mode akin to the one disclosed by the Application was, therefore, an extraordinary stretch.

Additionally, paragraph 63 of Gillespie specifically teaches that "a key on the main keyboard of computer system is designated as the touch screen activation key." A2323 [0063]. So Gillespie did not envision that users would enter the activated mode in which certain

icons are relocated or removed through a touch on the screen. It instead contemplates a different, physical button to perform this task.

Second, even if paragraph 61 did teach the sort of user-directed icon reconfiguration at issue here, neither Gillespie nor any other prior art provides a reason to combine that with the steady touch in paragraph 71. To find a combination of elements in the prior art obvious, the decisionmaker must find "there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418; *see Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1374-75 (Fed. Cir. 2011). The PTAB and the examiner identified none—other than the suggestion of intuition—and none can be found in the prior art.

On the contrary, the two paragraphs teach entirely different embodiments, and the patent hints at no connection. And, again, Gillespie *does* contain a reference to a user-directed reconfiguration elsewhere, but it relies on an entirely different type of action to initiate the process: a "software control panel." A2322 [0058]. So, far from teaching or suggesting a reason to combine a steady touch with icon reconfiguration, Gillespie teaches a totally different way of rearranging

icons. *Cf. In re NTP*, 654 F.3d at 1299 (noting that prior art itself was inconsistent with the PTAB's conclusion that a person or ordinary skill would combine elements).

C. The PTAB improperly used hindsight to reconstruct the invention from scattered prior art references.

Finally, in light of the PTAB and the examiner's failure to show a teaching or suggestion of the combination claimed in the Application, this Court can only conclude that their conclusion of obviousness is based on hindsight. This Court has said before that "[w]hen the Board does not explain the motivation, or the suggestion or teaching, that would have led the skilled artisan … to the claimed combination as a whole, we infer that the Board used hindsight to conclude that the invention was obvious." *In re Kahn*, 441 F.3d 997, 986 (Fed. Cir. 2006) (citing *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998)). A review of the PTAB's analysis leaves no doubt that hindsight played an improper role here. This too supports reversal.

The case law on obviousness is full of admonitions against hindsight reasoning. *E.g.*, *KSR*, 550 U.S. at 421; *In re Kotzab*, 217 F.3d at 1369; *In re NTP*, 654 F.3d at 1299. An obviousness analysis cannot proceed backwards from the claims to the prior art; it must proceed

forwards from the prior art, "guided only by the prior art references and the then-accepted wisdom in the field." *In re Kotzab*, 217 F.3d at 1369. "Close adherence to this methodology is especially important in cases"—like this one—"where the very ease with which the invention can be understood may prompt one 'to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher.'" *Id.* (quoting *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983)).

Yet the obviousness analysis performed below reads like a checklist designed to pair claim elements to prior art. A2061-63. As noted above (at 35), for each step in the claims, the examiner simply recited the claim language and then included a parenthetical cite to the prior art references in Hawkins or Gillespie that it thought taught that element. It then stated, in conclusory fashion, that "[o]ne of ordinary skill in the art would have recognized that [it was] … intuitive" to combine Hawkins and Gillespie. A2064.

This is not the way to conduct an obviousness inquiry. The problem with it, as with any checklist-style reconstruction like it, is that it improperly reduces the obviousness inquiry to "whether each element

existed in the prior art." *Grain Processing*, 840 F.2d at 907. Simply identifying references and stating that a person of ordinary skill in the art would find combining them "intuitive" does not suffice. *Id.*; *In re Kahn*, 441 F.3d at 986-97 (holding that "mere identification in the prior art of each element" is "insufficient to defeat … patentability"). The PTAB was required to support its conclusion with a reason or reasons *why* paragraphs 61 and 71 of Gillespie relate to each other or why one would combine them to teach the elements as stated in claims 38 and 40. But for its conclusory statement about what someone with skill in the art would have "recognized," it did not do so.

This Court has reversed obviousness determinations just like the one at issue here. In *In re NTP*, for example, the Court reversed the PTAB's affirmance of several rejections in a patent application for a system that sent emails via radio frequency, or "RF," network. 654 F.3d at 1285. The prior art disclosed only email systems that required a connection to a physical phone line. *Id.* The invention in the application was an improvement because it "integrate[d] existing electronic mail systems with RF wireless communications networks." *Id.* at 1286 (internal quotation marks omitted) (quoting *NTP, Inc. v.*

Research in Motion, Ltd., 418 F.3d 1282, 1289 (Fed. Cir. 2005)). And the claims explained precisely how it did so, by configuring an email system, a gateway switch, an RF network, an RF receiver, and other components into an integrated architecture. *Id.*

The PTAB's determination of obviousness in *In re NTP* was remarkably simplistic. It found first that the prior art disclosed the type of email system in the patent application. *Id.* at 1298. Then it located a piece of prior art (Harrison) that "discloses a system that incorporates an RF network into an existing [Local Area Network]." *Id.* It then plugged Harrison's RF network into the prior art email systems, and voila—by working backwards from the elements in the application to find references in the prior art, the PTAB concluded that the application's claims were obvious.

This Court reversed. Although it found that the PTAB had correctly identified the content of the prior art—an email system and an RF network—it found "as a matter of law [that] the claims would not have been obvious to one of ordinary skill in the art based on the combination [of the prior art]." *Id.* at 1298-99. The Court faulted the PTAB for "improperly rel[ying] on hindsight reasoning to piece together

elements to arrive at the claimed invention." *Id.* at 1299. And it hit on what makes hindsight reasoning so problematic: "Given *any* network, we could likely carve out a possible 'interface' and combine it with Harrison to hold that the addition of a RF information transmission network would have been obvious." *Id.* (emphasis added). In other words, working backwards from the patent, one can always identify elements and treat their combination as the most natural thing in the world. That is why the obviousness analysis must proceed forwards from the prior art, identifying what in the art teaches or suggests the combination in the patent application. The PTAB's failure to do so required reversal.

The same was true in *In re Kotzab*, discussed above (at 27-28), where this Court reversed after finding that "the Examiner and the Board fell into the hindsight trap." 217 F.3d at 1371. Without a "finding as to the specific understanding or principle" that made the combination of findings obvious, hindsight was all that remained. *Id.* Indeed, this Court's and Supreme Court case law is strewn with cautionary tales on the improper use of hindsight in the obviousness analysis. *See* 2-5 Donald S. Chisum, Chisum on Patents § 5.03[2][c]

(Matthew Bender 2015) ("The Supreme Court has frequently warned against the use of 'hindsight' in determining obviousness."); *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("[I]t is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art …."); *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) ("To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction—an illogical and inappropriate process by which to determine patentability.").

This Court should relegate this case to the same fate. The PTAB's analysis bears a remarkable resemblance to the ones in *In re NTP* and *In re Kotzab*. In both *In re NTP* and this case, the formula was a reference for a basic component of the invention—an email system in *In re NTP*; an icon reconfiguration mode here—plus a reference for the essential added component—the RF network in *In re NTP*; the sustained touch in both claims at issue here. But in neither case was there any explanation for why or how these references would be combined. So too in *In re Kotzab*, leading this Court to admonish that

the obviousness analysis must contain "particular findings … as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination." *In re Kotzab*, 217 F.3d at 1371. But the PTAB's sole reason here was the conclusory assertion that it would have been "intuitive." A2064.

Given any touchscreen interface, one could almost certainly work backwards to marry gestures identified in the prior art to certain functions on a device. *See Envt'l Designs, Ltd.*, 713 F.2d at 698 ("Virtually all inventions are combinations and virtually all are combinations of old elements."). But merely identifying in the prior art an instance in which a touch can click one thing but also activate another thing does not suffice—*of course* there are different types of touches that can be used for different purposes. But it cannot be that simply because touching, pointing, clicking, swiping, and so forth are contained in the prior art, those actions cannot be assigned to particular functions in nonobvious ways. If it were, then it is hard to see how any innovation related to a user interface would ever be entitled to patent protection. This Court should not indulge a § 103 analysis that would lead to such a bizarre result. Instead, it should reiterate that the

obviousness analysis must proceed forwards from prior art, not backwards from claim elements.

***

It is well recognized that "[t]hat which may be made clear and thus 'obvious' to a court, with the invention fully diagrammed … 'may have been a breakthrough of substantial dimension when first unveiled.'" *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051 (Fed. Cir. 1988) (quoting *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138 (Fed. Cir. 1985)). So it is here. The only thing in this case that suggests the combinations in claims 38 and 40 are those claims themselves. At best, the PTAB simply "retraced the path of the inventor[s]," *Ortho-McNeil Pharm., Inc.*, 520 F.3d at 1364. This Court should reverse.

III. The PTAB's Obviousness Determination Is Insufficiently Reasoned And Articulated.

Apple submits that the error here was the predictable outcome of an agency process that lacked reasoned decisionmaking and a clear articulation of the basis for its result. For the reasons elaborated upon in Apple's brief in *In re Lemay*, regardless of whether the Court agrees

with Apple on the merits, the conclusory quality of the PTAB's ruling here warrants comment from this Court.

It's Agency 101: All agency determinations should be the product of "reasoned decisionmaking" so that the result is "logical and rational." *Allentown Mack Sales and Serv., Inc. v. NLRB*, 522 U.S. 359, 374 (1998) (citation omitted). To that end, the agency must "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)). PTAB decisions are no exception—"[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some *articulated reasoning with some rational underpinning* to support the legal conclusion of obviousness." *KSR*, 550 U.S at 418. (emphasis added) (quoting *In re Kahn*, 441 F.3d at 988). And that reasoning "should be made explicit." 550 U.S at 418.

This requirement is hardly academic. In all contexts, "[r]easoned decisionmaking … promotes sound results." *Allentown Mack Sales*, 522

U.S. at 375. And as illustrated above (at 44-51), in the obviousness context, it is the "best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis." *In re Sang-Su Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002) (quoting *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)), *aff'd on subsequent appeal*, 262 F. App'x 275 (Fed. Cir. 2008). Indeed, in the iterative patent prosecution process in particular, reasoned decisionmaking and communication are the lifeblood of the entire system. U.S. Patent & Trademark Office, *Manual of Patent Examining Procedures* ("MPEP") § 706 (9th ed. 2014) ("The goal of examination is to clearly articulate any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity."); *accord* MPEP § 707.07(d) ("The burden is on the Office to establish any prima facie case of unpatentability (*see, e.g.*, MPEP § 2103), thus the reasoning behind any rejection must be clearly articulated.")). And if the rejection appears sound to the patent applicant, the patent applicant may amend and refine the application, MPEP § 714, ideally in conjunction with the examiner. If a rejection is unreasoned, the process grinds to a halt.

The analysis described throughout this brief has scarcely any reasoning at all. As Apple explains in its brief *In re Lemay*, this Court has not hesitated to vacate in these circumstances. *In re Sang-Su Lee*, 277 F.3d at 1344; *In re Giannelli*, 739 F.3d 1375 (Fed. Cir. 2014); *In re Vaidyanathan*, 381 F. App'x 985, 993 (Fed. Cir. 2010). A decision this sparsely reasoned leaves patent applicants with no ability to address the PTO's concerns, and creates a barrier to genuine appellate review. To further a fair and well-functioning patent system, this Court should not allow it to stand.

CONCLUSION

This Court should conclude that the PTAB erred in rejecting claims 38-41 as obvious.

November 2, 2015

Respectfully submitted,

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ADDENDUM

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARCEL VAN OS, FREDDY ALLEN ANZURES, SCOTT FORSTALL, GREG CHRISTIE, and IMRAN CHAUDHRI

Appeal 2013-004862
Application 12/364,470
Technology Center 2100

Before JEAN R. HOMERE, DANIEL N. FISHMAN, and BETH Z. SHAW, *Administrative Patent Judges*.

SHAW, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's final rejection of claims 1–3, 5, 6, 8, 9, 11–25, and 31–41. We have jurisdiction under 35 U.S.C. § 6(b). An oral hearing was conducted on May 12, 2015.

We affirm-in-part.

INVENTION

The invention relates to user interfaces that use touch-sensitive displays and include an interface reconfiguration mode. *See* Spec. ¶ 3.

Claims 1, 38, and 40 are representative and are reproduced below, with disputed limitations italicized:

> 1. A portable electronic device, comprising:
> a touch-sensitive display;
> one or more processors;
> memory; and
> one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the programs including instructions for:
> displaying a first plurality of icons in a first region on the touch-sensitive display;
> *detecting a first predefined user action comprising a sustained touch, with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;*
> *simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the simultaneously varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons*;
> and
> *detecting movement of the touch from the first location on the display to a second location on the display at which a second icon is located, and in response to the detected movement, moving the first icon to the second location.*
>
> 38. A portable electronic device including a graphical user interface, comprising:
> a touch-sensitive display configured to display the graphical user interface;

a processor coupled to communicate with the touch-sensitive display; and

a machine-readable storage medium including a plurality of instructions that, when executed by the processor, cause the performing of operations including,

displaying a plurality of icons of the graphical user interface on the touch-sensitive display, the icons individually corresponding to applications to provide additional functionality through the portable electronic device;

detecting a first user touch on the touch-sensitive display, the first user touch of a first duration and at a location proximate a first icon of the plurality of icons;

interpreting the detected first user touch as an input to initiate the application corresponding to that first icon;

detecting a second user touch on the touch-sensitive display, the second user touch of a second duration, longer than the first duration, and at a location proximate a second icon of the plurality of icons;

interpreting the detected second, longer, user touch as an input initiating an interface reconfiguration mode; and

in response to subsequent user movement on the touch screen from the location proximate the second icon to a third location, moving the second icon from the second location to the third location.

40. A method of operating a portable electronic device including a graphical user interface implemented through a touch screen interface, comprising the acts of:

displaying a first plurality of icons of the graphical user interface on the touch sensitive display;

detecting a first user touch on the touch-sensitive display, the first user touch of at least an established duration and at a first location proximate a first icon of the plurality of icons;

interpreting the detected first user touch as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location; and

> *in response to user movement of the touch on the touch screen from the first location proximate the first icon to a second location, moving the first icon from the first location to the second location.*

REJECTIONS

The Examiner rejected claims 1–3, 5, 6, 8, 9, 11–25, and 31–37 under 35 U.S.C. § 103(a) as being unpatentable over Hawkins et al. (US 7,231,229 B1; June 12, 2007), Gillespie et al. (US 2002/0191029 A1; Dec. 19, 2002), and Krishnan (US 6,278,454 B1; Aug. 21, 2001). Final Act. 2–12.

The Examiner rejected claims 38–41 under 35 U.S.C. § 103(a) as being unpatentable over Hawkins and Gillespie. Final Act. 12–16.

ISSUES

We focus our discussion below on the following dispositive issues:

Did the Examiner err in finding the combination of Hawkins, Gillespie, and Krishnan teaches or suggests the disputed limitations of:

> detecting a first predefined user action comprising a sustained touch, with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;
>
> simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the simultaneously varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons;
>
> and
>
> detecting movement of the touch from the first location on the display to a second location on the display at which a second icon is located, and in response to the detected

movement, moving the first icon to the second location

as recited in claim 1?

Did the Examiner err in finding the combination of Hawkins and Gillespie teaches or suggests the disputed limitations of:

> detecting a second user touch on the touch-sensitive display, the second user touch of a second duration, longer than the first duration, and at a location proximate a second icon of the plurality of icons;
>
> [and] interpreting the detected second, longer, user touch as an input initiating an interface reconfiguration mode;

as recited in claim 38?

Did the Examiner err in finding the combination of Hawkins and Gillespie teaches or suggests the disputed limitations of:

> interpreting the detected first user touch as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location; and
>
> in response to user movement of the touch on the touch screen from the first location proximate the first icon to a second location, moving the first icon from the first location to the second location

as recited in claim 40?

ANALYSIS

Claim 1

We conclude the Examiner erred in finding one skilled in the art would have recognized the combination of Hawkins, Gillespie, and Krishnan teaches or suggests teaches or suggests,

> simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined

> user action, wherein the simultaneously varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons

as recited in claim 1.

The Examiner cites Krishnan as "disclos[ing] that the icons are animated to indicate a state of the participant." Ans. 4.

> [I]t would not have been unreasonable to a person of ordinary skill in the art at the time of the invention to glean the advantages of simultaneously varying positions of at least two of the icons as the state of the call participant changes. For instance, two callers being on hold, or two callers entering a conference call at the time [sic] same time, or two callers exiting the conference at the same time or two callers speaking at the same time.

Ans. 4.

However, although Krishnan describes that "icons . . . can also be animated to indicate a state," (Krishnan 7:8–10) we agree with Appellants that the cited disclosure does not teach or suggest "simultaneously varying multiple icons **in response to detecting a predefined user action for initiating a user interface reconfiguration process**." App. Br. 18; Reply Br. 11. We agree with Appellants that "even if there was a circumstance in Krishnan where multiple icons simultaneously varied their positions, multiple actions would be required to animate the multiple icons (i.e., multiple call participants would need to enter states that require user or operator attention), rather than a single action." App. Br. 18; Reply Br. 11.

Because Appellants have shown at least one reversible error in the Examiner's rejection, we need not reach Appellants' remaining arguments. Accordingly, we do not sustain the rejection of claim 1. For the same

reasons, we also reverse the rejection of independent claims 11, 16, and 21, and of each associated dependent claim.

Claim 38

We conclude the Examiner did not err in finding one skilled in the art would have recognized the combination of Hawkins and Gillespie teaches or suggests the disputed limitation of claim 38. Appellants argue Gillespie triggers an icon's single activated function, which "has nothing to do with initiating a user interface reconfiguration mode." App. Br. 22. However, the Examiner rejects claim 38 over the *combined* teachings of Hawkins and Gillespie, and what the combined teachings *would have suggested* to one of ordinary skill in the art. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

The Examiner concludes:

> [i]t would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Hawkins of initiating a mode for reconfiguring the positions of icons displayed on a touch-sensitive display by dragging the icons to a new position with the teachings of Gillespie of visually indicating to a user on a display when a predefined user interface reconfiguration mode has been entered into by the user by sustaining a touch on the user interface. One of ordinary skill in the art would have recognized that Gillespie's technique of entering a user interface reconfiguration mode in response to a user sustaining a touch in proximity to an icon displayed on the touchscreen would be an intuitive way for users of Hawkins' device to enter into the editing mode in which they could rearrange the icons corresponding to applications on the interface.

Final Act. 15. We find the Examiner did not err by combining Gillespie's teachings of a user touch of a longer duration (*see* Gillespie, ¶ 71) and of a reconfiguration process (*see id.* at ¶ 61) with Hawkins' disclosure of an interface reconfiguration mode (Hawkins 17:44–54). *See* Final Act. 13–14. Accordingly, we sustain the Examiner's rejection of claim 38 under 35 U.S.C. § 103(a).

Claim 40

We conclude the Examiner did not err in finding one skilled in the art would have recognized the combination of Hawkins and Gillespie teaches or suggests the disputed limitation of claim 40. Appellants argue Hawkins "discloses a first user action for selecting a command to enter a new screen for editing a previous screen configuration, and a second, separate user action for dragging an icon on a current display from a first location to a second location." App. Br. 24. However, the Examiner rejects claim 40 over the combined teachings of Hawkins and Gillespie, and what the combined teachings would have suggested to one of ordinary skill in the art. For the same reasons as discussed above with respect to claim 38, we are unpersuaded the Examiner erred in combining Hawkins's teaching of rearrangement of buttons and Gillespie's teaching of a steady touch and of adding or removing icons. *See* Ans. 5–6. Accordingly, we sustain the Examiner's rejection of claim 40 under 35 U.S.C. § 103(a).

Because Appellants have not presented separate patentability arguments or has reiterated substantially the same patentability arguments as those previously discussed for claim 38 and 40 (App. Br. 21–24), we also

sustain the rejections of claim 39 and 41. *See* 37 C.F.R. § 41.37(c)(1)(iv)(2012).

DECISION

We reverse the rejections of claims 1–3, 5, 6, 8, 9, 11–25, and 31–37.

We affirm the rejections of claims 38–41.

AFFIRMED-IN-PART

ACP

Patent Application No. 12/364,470 (Amended Claims)

VIII. CLAIMS APPENDIX

CLAIMS CURRENTLY ON APPEAL ORDERED BY NUMBER

1. (Previously Presented) A portable electronic device, comprising:

a touch-sensitive display;

one or more processors;

memory; and

one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the programs including instructions for:

displaying a first plurality of icons in a first region on the touch-sensitive display;

detecting a first predefined user action comprising a sustained touch, with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;

simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the simultaneously varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons; and

detecting movement of the touch from the first location on the display to a second location on the display at which a second icon is located, and in response to the detected movement, moving the first icon to the second location.

2. (Previously Presented) The device of claim 1, wherein the instructions for simultaneously varying positions include instructions for animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

3. (Previously Presented) The device of claim 1, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

4. (Canceled)

5. (Previously Presented) The device of claim 1, further comprising instructions for fixing a position of the first icon at the second location in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

6. (Previously Presented) The device of claim 1, further comprising instructions for moving the second icon from the second location to a new position.

7. (Canceled)

8. (Previously Presented) The device of claim 1, further comprising:

detecting a user making a second point of contact with the touch-sensitive display at a third position corresponding to a third icon in a second plurality of icons in a second region on the touch-sensitive display and instructions for detecting movement of the second point of contact to a fourth position in the first region on the touch-sensitive display; and

responding to detecting the second point of contact and detecting movement of the second point of contact by displaying movement of the third icon to the fourth position of the touch-sensitive display and displaying the third icon at the fourth position.

9. (Previously Presented) The device of claim 8, further comprising instructions for fixing a position of the first icon at the second location and a position of the third icon at the fourth position in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

10. (Canceled)

11. (Previously Presented) A non-transitory computer readable storage medium storing one or more programs, the one or more programs comprising instructions, which when executed by a portable electronic device with a touch-sensitive display, cause the device to:

display a first plurality of icons in a first region on the touch-sensitive display;

detect a first predefined user action comprising a sustained touch, with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;

simultaneously vary positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the simultaneously varying

includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons; and

detect movement of the touch from the first location on the display to second location on the display at which a second icon is located, and in response to the detected movement, move the first icon to the second location.

12. (Previously Presented) The computer readable storage medium of claim 11, wherein simultaneously varying positions includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

13. (Previously Presented) The computer readable storage medium of claim 11, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

14. (Previously Presented) The computer readable storage medium of claim 11, further comprising instructions, which when executed by the portable electronic device with the touch-sensitive display, cause the device to:

fix a position of the first icon at the second location in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

15. (Previously Presented) The computer readable storage medium of claim 11, further comprising instructions, which when executed by the portable electronic device with the touch-sensitive display, cause the device to move the second icon from the second location to a new position.

16. (Previously Presented) A graphical user interface on a portable electronic device with a touch-sensitive display, comprising:

a first plurality of icons displayed in a first region on the touch-sensitive display, wherein:

a first predefined user action is detected, comprising a sustained touch with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;

positions of multiple icons of the first plurality of icons are simultaneously varied in response to detecting the first predefined user action, wherein the simultaneously varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons; and

movement of the touch from the first location on the display to a second location on the display at which a second icon is located is detected, and in response to the detected movement, the first icon is moved to the second location.

17. (Previously Presented) The graphical user interface of claim 16, wherein the simultaneously varying positions of multiple icons includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

18. (Previously Presented) The graphical user interface of claim 16, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

19. (Previously Presented) The graphical user interface of claim 16, wherein:

a position of the first icon is fixed at the second location in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

20. (Previously Presented) The graphical user interface of claim 16, wherein:

the second icon is moved from the second location to a new position.

21. (Previously Presented) A method, comprising:

at a portable electronic device with a touch-sensitive display:

displaying a first plurality of icons in a first region on the touch-sensitive display;

detecting a first predefined user action comprising a sustained touch, with respect to the touch-sensitive display at a first location on a first icon on the display, for initiating a predefined user interface reconfiguration process;

simultaneously varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the simultaneously

varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons; and

detecting movement of the touch from the first location on the display to a second location on the display at which a second icon is located, and in response to the detected movement, moving the first icon to the second location.

22. (Previously Presented) The method of claim 21, wherein the simultaneously varying includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

23. (Previously Presented) The method of claim 21, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

24. (Previously Presented) The method of claim 21, further comprising

fixing a position of the first icon at the second location in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

25. (Previously Presented) The method of claim 21, further comprising moving the second icon from the second location to a new position.

26. (Withdrawn) A method of operating a computing device with a touch-sensitive display, the method comprising:

displaying a first plurality of icons on the touch-sensitive display;

entering a reconfiguration mode in response to detecting a contact on one of the first plurality of icons for greater than a predetermined time; and

moving at least one of the first plurality of icons from a location among the first plurality of icons to a location among a second plurality of icons.

27. (Withdrawn) The method of claim 26, wherein the at least one of the first plurality of icons comprises multiple additional icons, the multiple additional icons also being moved between the first plurality and the second plurality.

28. (Withdrawn) An article comprising:

a storage medium having stored thereon instructions which, when executed by a computing device with a touch-sensitive display, result in the computing device being capable of:

displaying a first plurality of icons on the touch-sensitive display;

entering a reconfiguration mode in response to detecting a contact on one of the first plurality of icons for greater than a predetermined time; and

moving at least one of the first plurality of icons from a location among the first plurality of icons to a location among a second plurality of icons.

29. (Withdrawn) An apparatus comprising:

a touch-sensitive display;

means for displaying a first plurality of icons on the touch-sensitive display;

means for entering a reconfiguration mode in response to detecting a contact on one of the first plurality of icons for greater than a predetermined time; and

means for moving at least one of the first plurality of icons from a location among the first plurality of icons to a location among a second plurality of icons.

30. (Withdrawn) An apparatus comprising:

a computing device with a touch-sensitive display, the computing device being capable of:

displaying a first plurality of icons on the touch-sensitive display;

entering a reconfiguration mode in response to detecting a contact on one of the first plurality of icons for greater than a predetermined time; and

moving at least one of the first plurality of icons from a location among the first plurality of icons to a location among a second plurality of icons.

31. (Previously Presented) The device of claim 1, wherein the user interface reconfiguration process occurs in an interface reconfiguration mode, distinct from a normal operation mode, that allows a user to reposition displayed graphical objects.

32. (Previously Presented) The computer readable storage medium of claim 11, wherein the user interface reconfiguration process occurs in an interface reconfiguration mode,

distinct from a normal operation mode, that allows a user to reposition displayed graphical objects.

33. (Previously Presented) The graphical user interface of claim 16, wherein the user interface reconfiguration process occurs in an interface reconfiguration mode, distinct from a normal operation mode, that allows a user to reposition displayed graphical objects.

34. (Previously Presented) The method of claim 21, wherein the user interface reconfiguration process occurs in an interface reconfiguration mode, distinct from a normal operation mode, that allows a user to reposition displayed graphical objects.

35. (Previously Presented) The device of claim 1, the one or more programs further including instructions for detecting termination of the touch input at the second location, and in response to that detection, moving the second icon to a third location on the display.

36. (Previously Presented) The computer readable storage medium of claim 11, the one or more programs further including instructions which cause the device to detect termination of the touch input at the second location, and in response to that detection, moving the second icon to a third location on the display.

37. (Previously Presented) The method of claim 21, further comprising detecting termination of the touch input at the second location, and in response to that detection, moving the second icon to a third location on the display.

38. (Previously Presented) A portable electronic device including a graphical user interface, comprising:

a touch-sensitive display configured to display the graphical user interface;

a processor coupled to communicate with the touch-sensitive display; and

a machine-readable storage medium including a plurality of instructions that, when executed by the processor, cause the performing of operations including,

displaying a plurality of icons of the graphical user interface on the touch-sensitive display, the icons individually corresponding to applications to provide additional functionality through the portable electronic device;

detecting a first user touch on the touch-sensitive display, the first user touch of a first duration and at a location proximate a first icon of the plurality of icons;

interpreting the detected first user touch as an input to initiate the application corresponding to that first icon;

detecting a second user touch on the touch-sensitive display, the second user touch of a second duration, longer than the first duration, and at a location proximate a second icon of the plurality of icons;

interpreting the detected second, longer, user touch as an input initiating an interface reconfiguration mode; and

in response to subsequent user movement on the touch screen from the location proximate the second icon to a third location, moving the second icon from the second location to the third location.

39. (Previously Presented) The portable electronic device of claim 38, wherein the plurality of instructions, when executed, perform further operations, comprising, in response to said subsequent user movement on the touch screen, moving at least one additional icon of the plurality of icons from the third location to a fourth location to make room for the second icon at the third location, wherein the movement of the additional icon is performed in the absence of an additional user input.

40. (Previously Presented) A method of operating a portable electronic device including a graphical user interface implemented through a touch screen interface, comprising the acts of:

displaying a first plurality of icons of the graphical user interface on the touch-sensitive display;

detecting a first user touch on the touch-sensitive display, the first user touch of at least an established duration and at a first location proximate a first icon of the plurality of icons;

interpreting the detected first user touch as an input to initiate an interface reconfiguration mode, and in the absence of a further user input allowing movement of at least the first icon from the first location; and

in response to user movement of the touch on the touch screen from the first location proximate the first icon to a second location, moving the first icon from the first location to the second location.

41. (Previously Presented) The method of claim 40, wherein the act of allowing movement of at least the first icon from the first location comprises allowing the movement

of at least one icon of a second plurality of icons, wherein the second plurality of icons forms at least some portion of the first plurality of icons, and wherein the second plurality of icons includes the first icon.

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(54) **PORTABLE ELECTRONIC DEVICE WITH INTERFACE RECONFIGURATION MODE**

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(21) Appl. No.: **12/364,470**

(22) Filed: **Feb. 2, 2009**

Related U.S. Application Data

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Publication Classification

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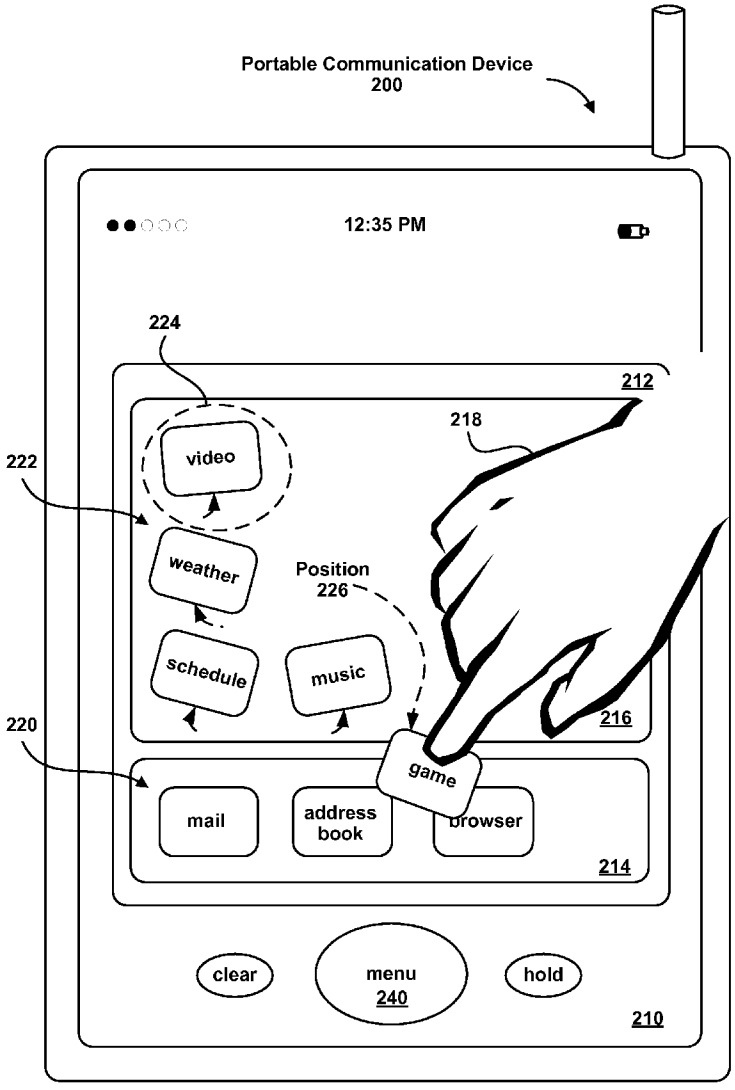
G06F 3/041 (2006.01)

(52) **U.S. Cl.** **715/846**; 345/173

(57) **ABSTRACT**

A portable electronic device displays a plurality of icons (e.g., graphical objects) in a region in a touch-sensitive display; detects a predefined user action, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and varies positions of one or more icons in the plurality of icons in response to detecting the predefined user action. The varying includes varying the positions of the one or more icons about respective average positions.



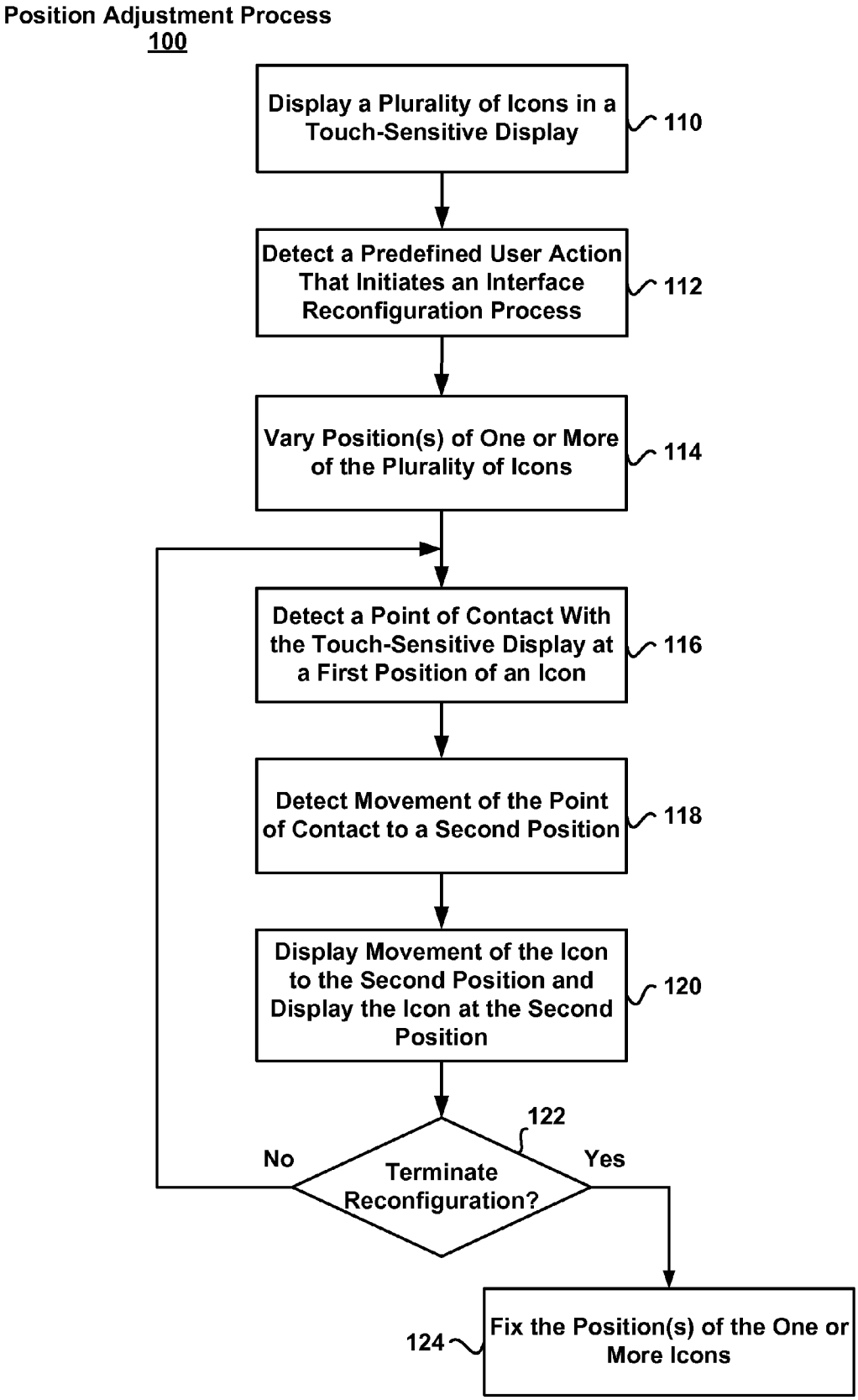

Position Adjustment Process
100
Display a Plurality of Icons in a Touch-Sensitive Display
110
Detect a Predefined User Action That Initiates an Interface Reconfiguration Process
112
Vary Position(s) of One or More of the Plurality of Icons
114
Detect a Point of Contact With the Touch-Sensitive Display at a First Position of an Icon
116
Detect Movement of the Point of Contact to a Second Position
118
Display Movement of the Icon to the Second Position and Display the Icon at the Second Position
120
122
No
Terminate Reconfiguration?
Yes
124
Fix the Position(s) of the One or More Icons

Figure 1

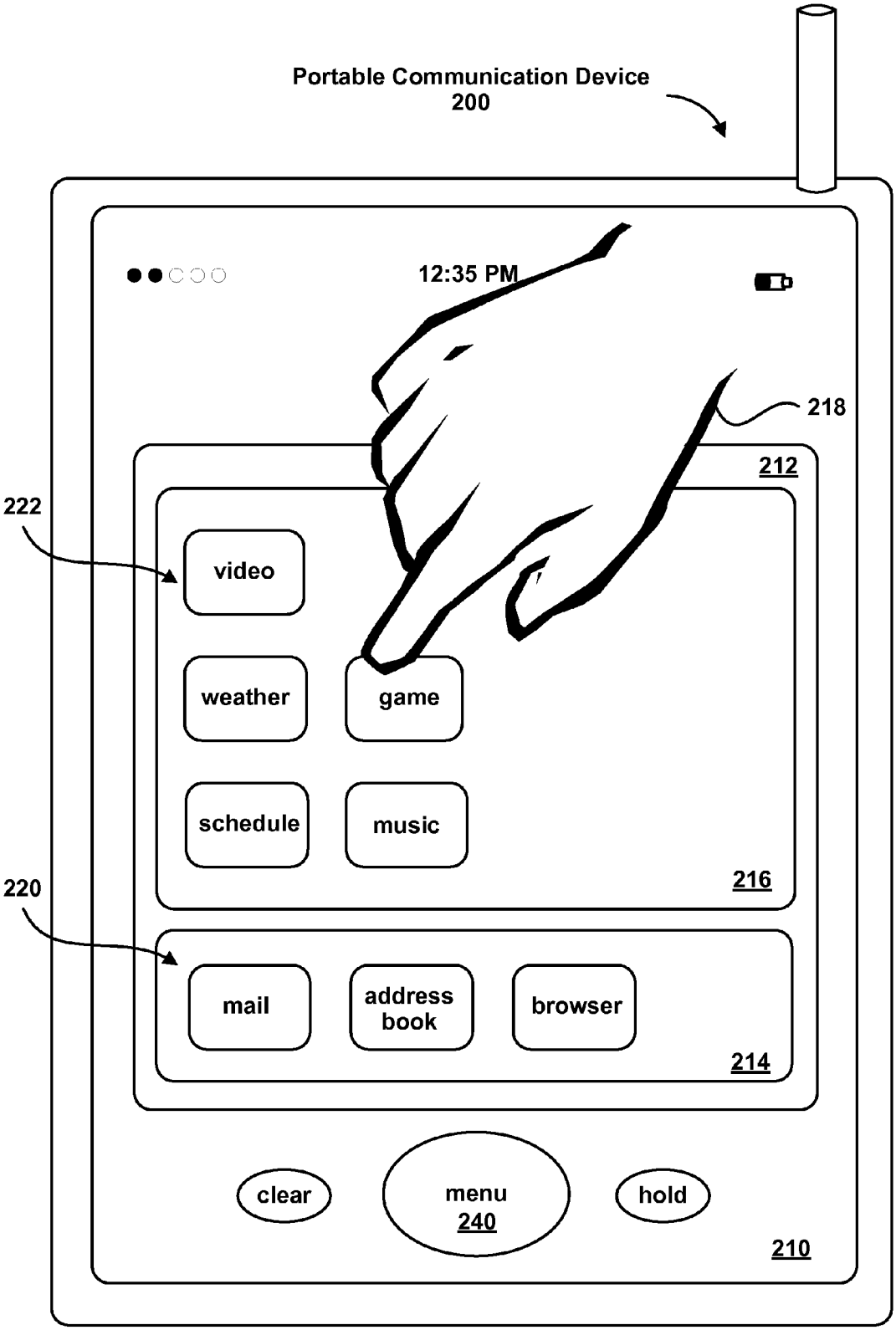

Portable Communication Device
200
12:35 PM
218
212
222
video
weather
game
schedule
music
216
220
mail
address book
browser
214
clear
menu
240
hold
210

Figure 2A

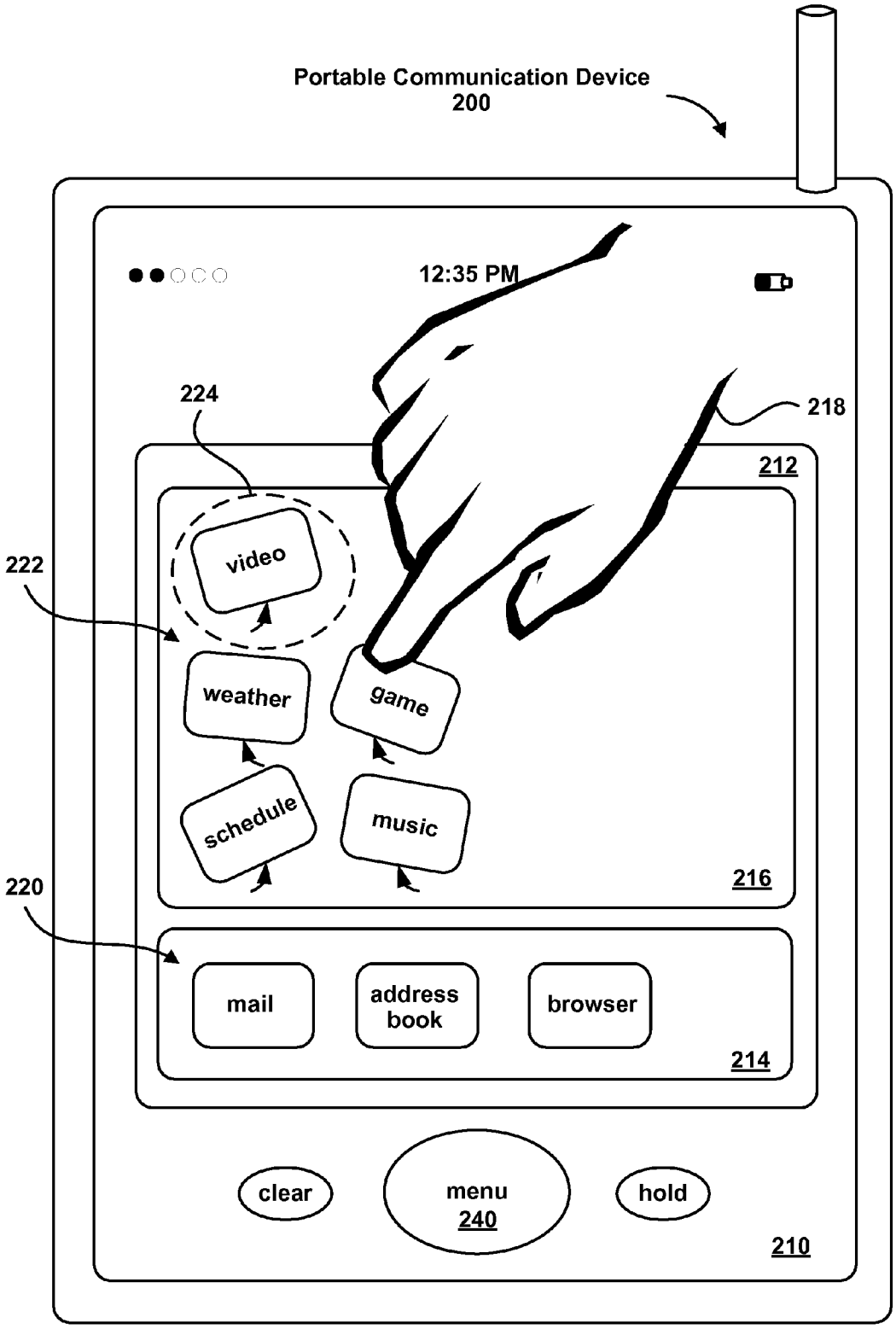

Portable Communication Device
200
12:35 PM
224
218
212
video
222
weather
game
schedule
music
220
216
mail
address book
browser
214
clear
menu
240
hold
210

Figure 2B

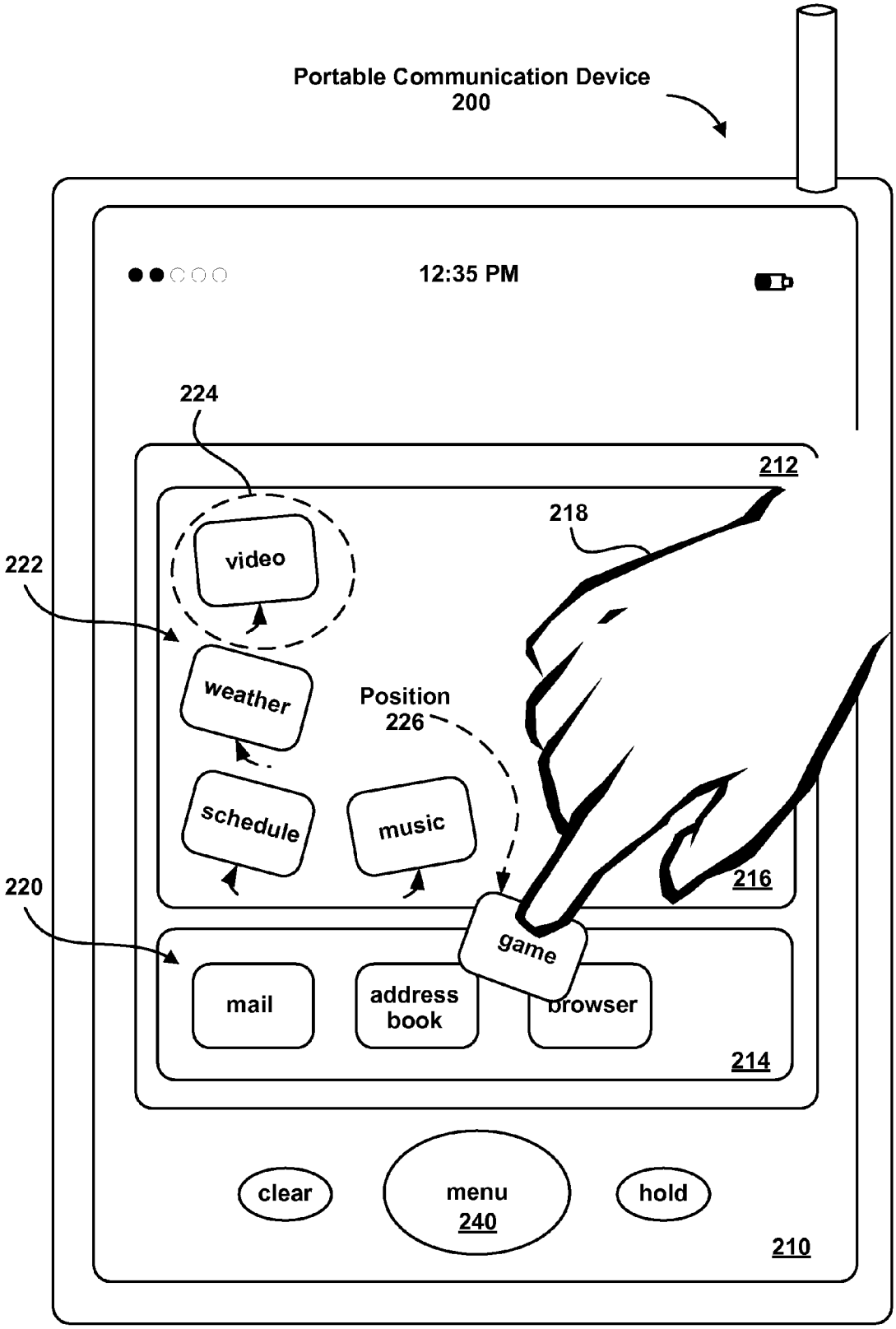

Portable Communication Device
200
12:35 PM
224
212
218
222
video
weather
Position
226
schedule
music
220
216
game
mail
address book
browser
214
clear
menu
240
hold
210

Figure 2C

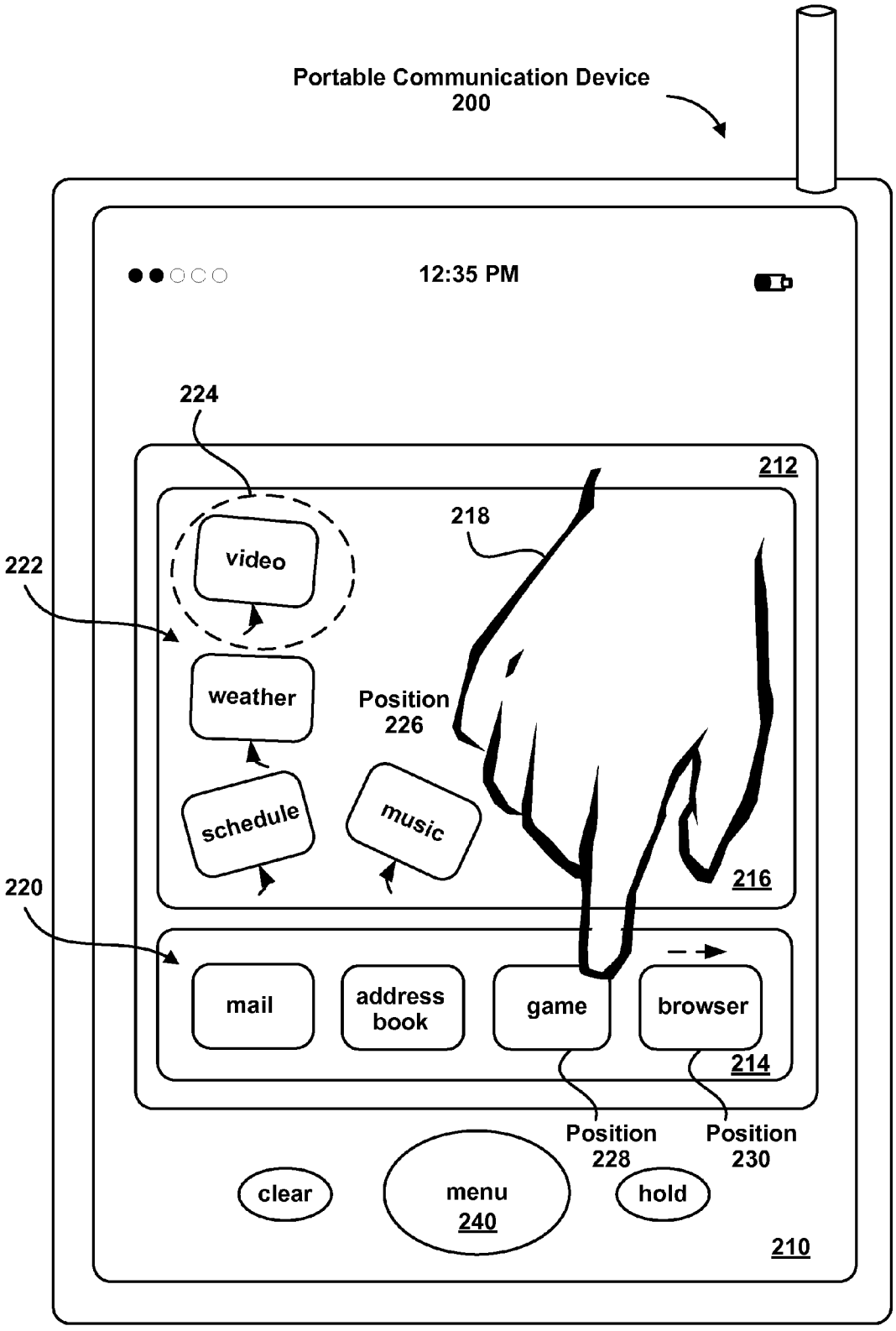

Portable Communication Device
200
12:35 PM
224
212
218
222
video
weather
Position
226
schedule
music
220
216
mail
address book
game
browser
214
Position
228
Position
230
clear
menu
240
hold
210

Figure 2D

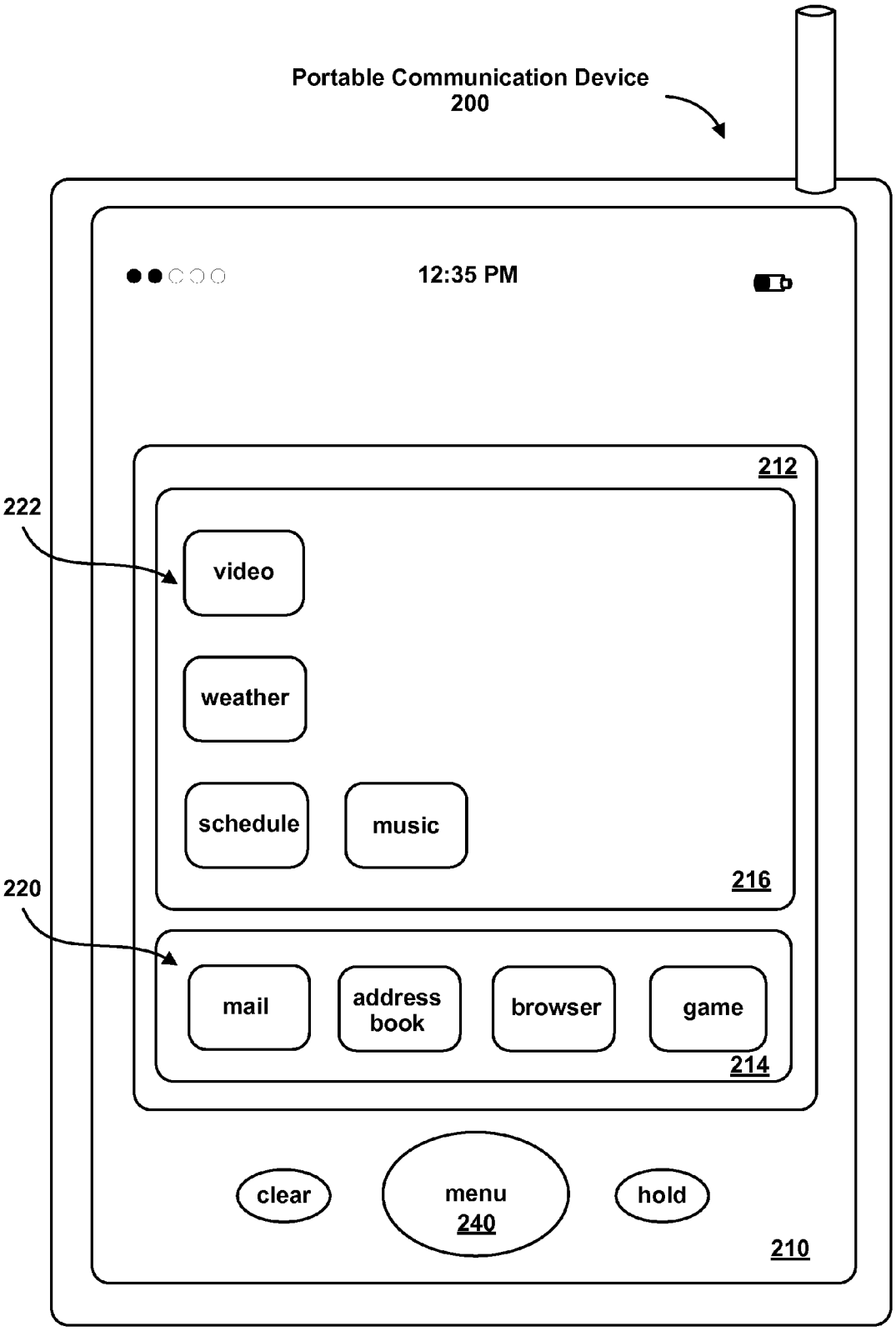

Portable Communication Device
200
12:35 PM
212
222
video
weather
schedule
music
216
220
mail
address book
browser
game
214
clear
menu
240
hold
210

Figure 2E

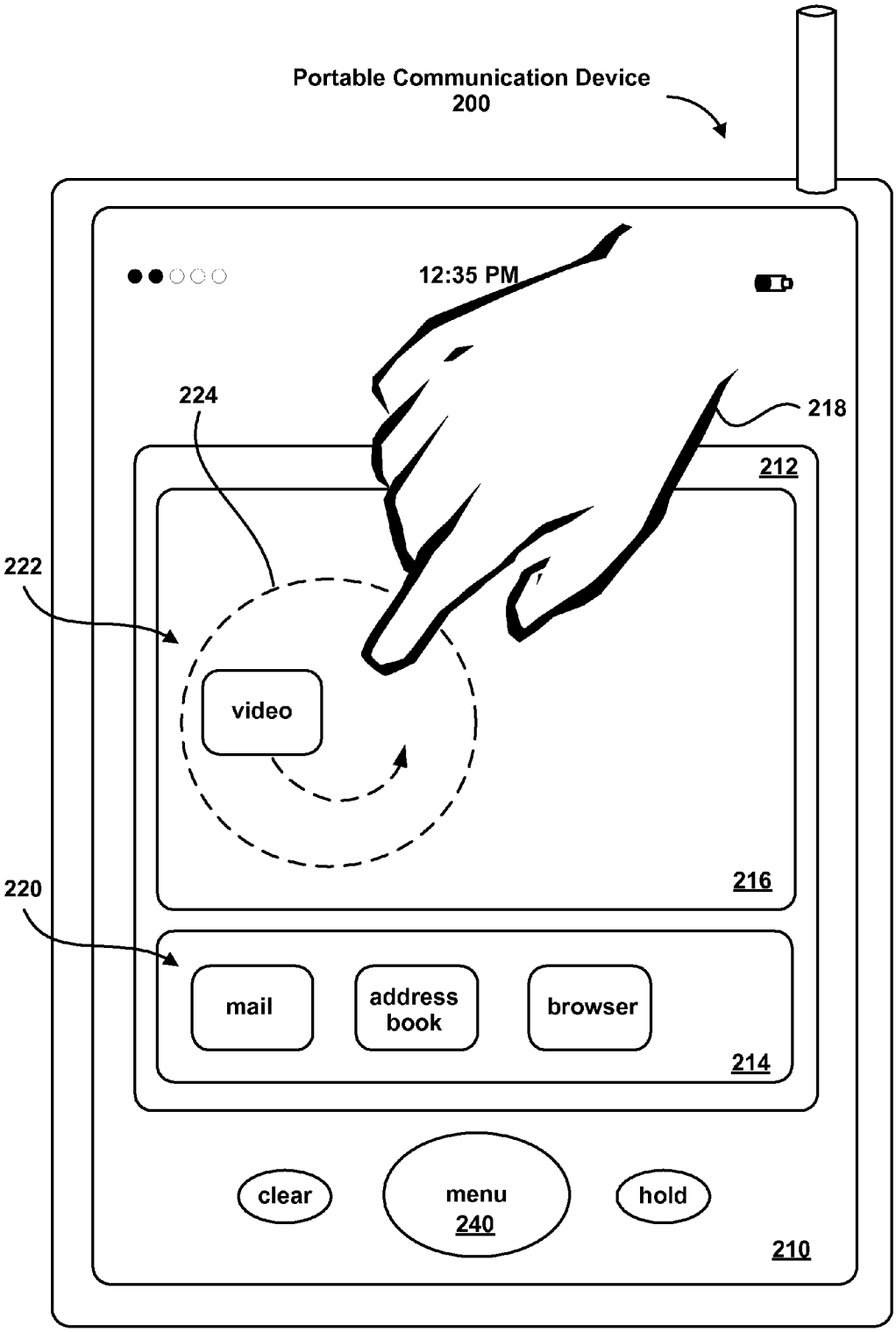

Portable Communication Device
200
12:35 PM
224
218
212
222
video
216
220
mail
address book
browser
214
clear
menu
240
hold
210

Figure 3A

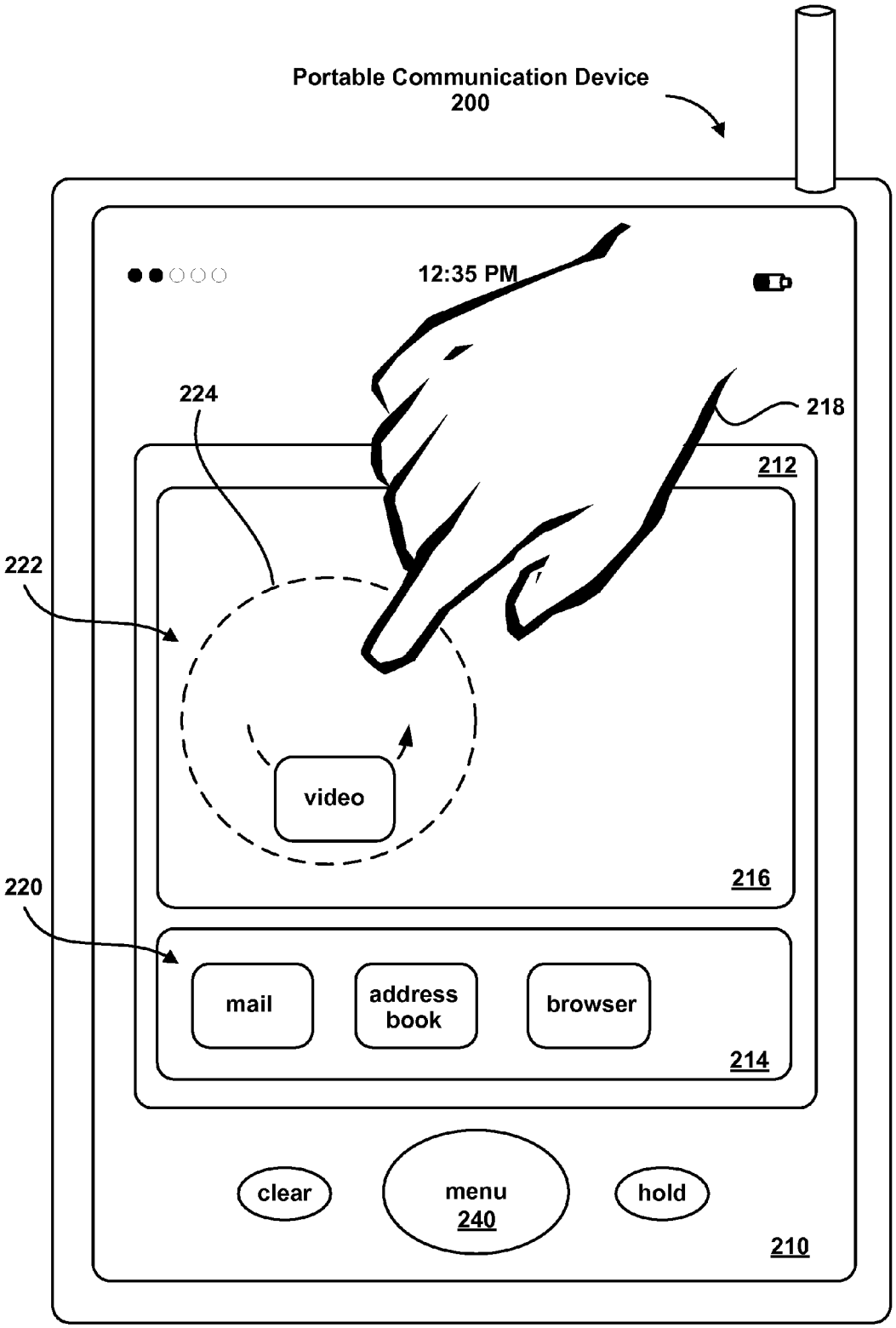

Portable Communication Device
200
12:35 PM
224
218
212
222
video
216
220
mail
address book
browser
214
clear
menu
240
hold
210

Figure 3B

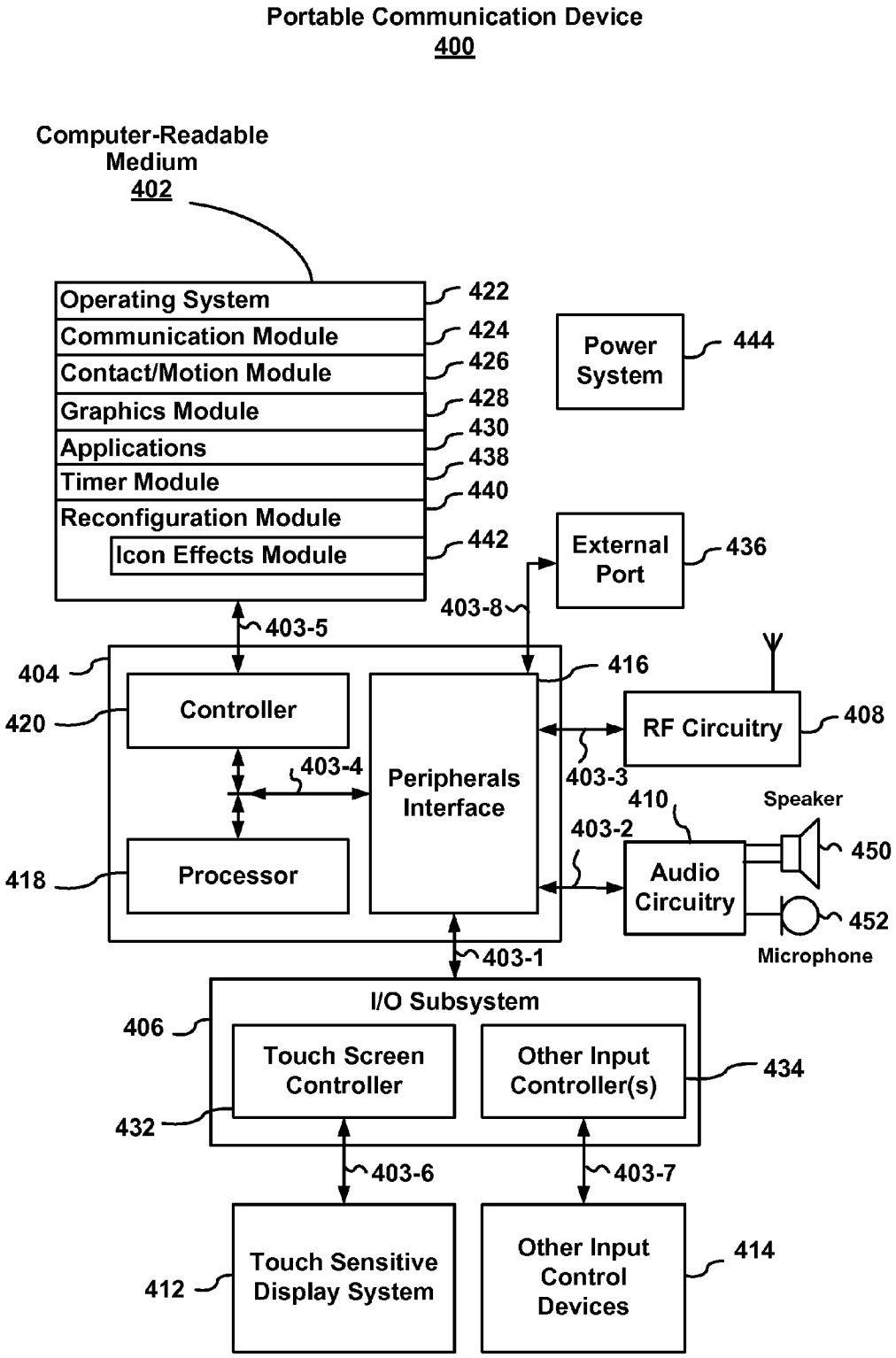

Portable Communication Device
400
Computer-Readable Medium
402
Operating System
422
Communication Module
424
Contact/Motion Module
426
Graphics Module
428
Applications
430
Timer Module
438
Reconfiguration Module
440
Icon Effects Module
442
Power System
444
External Port
436
403-8
403-5
404
420
Controller
416
RF Circuitry
408
403-4
Peripherals Interface
403-3
410
Speaker
403-2
450
418
Processor
Audio Circuitry
452
Microphone
403-1
I/O Subsystem
406
Touch Screen Controller
Other Input Controller(s)
434
432
403-6
403-7
Touch Sensitive Display System
412
Other Input Control Devices
414

Figure 4

PORTABLE ELECTRONIC DEVICE WITH INTERFACE RECONFIGURATION MODE

RELATED APPLICATIONS

[0001] This application is a continuation of U.S. patent application Ser. No. 11/459,602, filed Jul. 24, 2006, entitled "Portable Electronic Device with Interface Reconfiguration Mode," which application is incorporated by reference herein in its entirety.

[0002] This application claims priority to U.S. Provisional Patent Application No. 60/755,368, filed Dec. 30, 2005, entitled "Portable Electronic Device with Interface Reconfiguration Mode," which application is incorporated by reference herein in its entirety.

TECHNICAL FIELD

[0003] The disclosed embodiments relate to user interfaces, and in particular, to user interfaces that use touch-sensitive displays and include an interface reconfiguration mode.

BACKGROUND

[0004] As portable devices become more compact, and the amount of information to be processed and stored increases, it has become a significant challenge to design a user interface that allows users to easily interact with the device. This is unfortunate since the user interface is the gateway through which users receive not only content but also responses to user actions or behaviors, including user attempts to access a device's features or tools. Some portable electronic devices (e.g., mobile phones) have resorted to adding more pushbuttons, overloading the functions of pushbuttons, or using complex menu systems to allow a user to access, store and manipulate data. These conventional user interfaces often result in complicated key sequences and menu hierarchies that must be memorized by the user.

[0005] Many conventional user interfaces, such as those that include physical pushbuttons, are also inflexible. This is unfortunate because it may prevent a user interface from being configured and/or adapted by either an application running on the portable device or by users. When coupled with the time consuming requirement to memorize multiple key sequences and/or menu hierarchies, such inflexibility is frustrating to many users.

[0006] Some conventional user interfaces can be configured by users, thereby allowing at least partial customization. Unfortunately, the process of modifying such conventional user interfaces is often as cumbersome and complicated as the use of the conventional user interface itself. In particular, the required behaviors during configuration of such conventional user interfaces are often counter intuitive and the corresponding indicators guiding user actions are often difficult to understand. These challenges are often a source of additional frustration for users.

[0007] Accordingly, there is a need for a more transparent and intuitive user interfaces for portable devices that enable a user to configure the user interface.

SUMMARY OF EMBODIMENTS

[0008] The above deficiencies and other problems associated with user interfaces for portable devices are reduced or eliminated by the disclosed portable electronic device, which includes an interface reconfiguration mode that intuitively allows a user to reposition displayed graphical objects.

[0009] One aspect of the invention is a method in which a portable electronic device displays a first plurality of icons (e.g., graphical objects) in a first region in a touch-sensitive display; detects a first predefined user action, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and varies positions of one or more icons in the first plurality of icons in response to detecting the first predefined user action. The varying includes varying the positions of the one or more icons about respective average positions.

[0010] The varying may include animating the one or more icons to simulate floating of the one or more icons on a surface corresponding to a surface of the touch-sensitive display.

[0011] The varying position of a respective icon in the one or more icons may correspond to an equation of motion in a plane substantially coincident with the touch-sensitive display. The equation of motion may have a coefficient of friction less than a threshold, a non-zero initial velocity for the respective icon, a non-zero angular velocity, and/or a restoring force about the respective average position of the respective icon such that the position of the respective icon oscillates in a region substantially centered on the respective average position of the respective icon. In some embodiments, the respective icon rotates about the respective average position of the respective icon while maintaining a fixed orientation with respect to the touch-sensitive display.

[0012] In some embodiments, the method further includes: detecting a user making a point of contact with the touch-sensitive display at a first position corresponding to a first icon in the one or more icons and detecting movement of the point of contact to a second position of the touch-sensitive display; and responding to detecting the point of contact and detecting movement of the point of contact by displaying movement of the first icon to the second position of the touch-sensitive display, and displaying the first icon at the second position.

[0013] A second icon in the one or more icons may be moved from a respective initial position to a respective new position when the second position of the first icon at least partially overlaps with the respective initial position of the second icon. The position of the first icon may be fixed at the second position in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

[0014] The aforementioned methods may be performed by a portable electronic device having a touch-sensitive display with a graphical user interface (GUI), one or more processors, memory and one or more modules, programs or sets of instructions stored in the memory for performing these methods. In some embodiments, the portable electronic device provides a plurality of functions, including wireless communication.

[0015] Instructions for performing the aforementioned methods may be included in a computer program product configured for execution by one or more processors.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] For a better understanding of the aforementioned embodiments of the invention as well as additional embodiments thereof, reference should be made to the Description of

Embodiments below, in conjunction with the following drawings in which like reference numerals refer to corresponding parts throughout the figures.

[0017] FIG. **1** is a flow diagram of one embodiment of a position adjustment process for a portable electronic device.

[0018] FIG. **2**A is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0019] FIG. **2**B is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0020] FIG. **2**C is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0021] FIG. **2**D is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0022] FIG. **2**E is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0023] FIG. **3**A is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0024] FIG. **3**B is an illustration of one embodiment of a portable electronic device responsive to touch input for adjustment of the position of one or more icons.

[0025] FIG. **4** is a block diagram of one embodiment of a portable electronic device.

DESCRIPTION OF EMBODIMENTS

[0026] Reference will now be made in detail to embodiments, examples of which are illustrated in the accompanying drawings. In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one of ordinary skill in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail so as not to unnecessarily obscure aspects of the embodiments.

Overview of the Interface Reconfiguration Mode

[0027] Attention is directed towards embodiments of portable electronic devices, including portable communications devices, that have graphical user interfaces (GUIs). The portable devices include an interface reconfiguration mode. In response to a user initiating the interface reconfiguration mode, positions of one or more icons displayed on the portable device may be varied about respective average positions. The varying of the positions of the one or more icons may include animating the one or more icons to simulate floating of the one or more icons on a surface corresponding to a surface of a display in the portable device. The display may be a touch-sensitive display, which responds to physical contact by a stylus or one or more fingers at one or more contact points. While the following embodiments may be equally applied to other types of displays, a touch-sensitive display is used as an illustrative example.

[0028] The varying of the positions of the one or more icons may intuitively indicate to the user that the positions of the one or more icons may be reconfigured by the user. The user may modify, adapt and/or reconfigure the positions of the one or more icons. In embodiments where the portable device includes a touch-sensitive display, the user may make contact with the touch-sensitive display proximate to a respective icon at a first position. Upon making contact with the touch-sensitive display, the respective icon may cease varying its position. The user may drag the respective icon to a second position. Upon breaking contact with the touch-sensitive display, the respective icon may resume varying its position. In some embodiments, the respective icon can be "thrown," so that the final position of the respective icon is different from the point at which the icon is released. In this embodiment, the final position can depend on a variety of factors, such as the speed of the "throw," the parameters used in a simulated equation of motion for the "throw" (e.g., coefficient of friction), and/or the presence of a lay out grid with simulated attractive forces. In some embodiments, the display may include two regions. During the interface reconfiguration mode, positions of one or more icons displayed in the first region may be varied while positions of one or more icons displayed in the second region may be stationary.

[0029] The user may similarly modify, adapt and/or reconfigure the positions of additional icons during the interface reconfiguration mode. When the user has completed these changes (at least for the time being), he or she may terminate the interface reconfiguration mode. In response to this user action, the portable device may return to a normal mode of operation and the varying of the displayed positions of the one or more icons will cease.

[0030] The user may initiate or terminate the interface reconfiguration process by selecting one or more appropriate physical buttons on the portable device, by a gesture (such as making contact and swiping one or more fingers across the touch-sensitive display or making contact and holding for more than a predefined time period) and/or by selecting one or more soft buttons (such as one or more icons that are displayed on the touch-sensitive display). As used herein, a gesture is a motion of the object/appendage making contact with the touch screen display surface. In some embodiments, the interface reconfiguration process terminates a pre-defined time after the interface reconfiguration process is initiated, i.e., there is a time out.

[0031] The one or more icons displayed on the portable device may be graphical objects. In some embodiments, the one or more icons may be widgets, which are combinations of states and procedures that constitute on-screen representations of controls that may be manipulated by the user, such as bars, buttons and text boxes. In an exemplary embodiment, the one or more icons correspond to application programs (email, browser, address book, etc.) that may be selected by the user by contacting the touch-sensitive display proximate to an icon of interest.

[0032] FIG. **1** is a flow diagram of one embodiment of a position adjustment process **100** for a portable electronic device. While the position adjustment process **100** described below includes a number of operations that appear to occur in a specific order, it should be apparent that the process **100** can include more or fewer operations, which can be executed serially or in parallel (e.g., using parallel processors or a multi-threading environment), an order of two or more operations may be changed and/or two or more operations may be combined into a single operation.

[0033] In the position adjustment process **100**, a plurality of icons are displayed in a GUI in a touch-sensitive display (**110**). A first predefined user action that initiates an interface reconfiguration process is detected (**112**). Exemplary pre-

defined user actions include selecting a physical button on the portable device, making a predefined gesture on the touch screen display surface, or selecting a soft button. Position(s) of one or more of the plurality of displayed icons are varied (**114**). A point of contact with the touch-sensitive display at a first position of a respective icon is detected (**116**). Movement of the point of contact to a second position is detected (**118**). Movement of the respective icon to the second position is displayed and the respective icon is displayed at the second position (**120**).

[0034] If a second predefined user action that terminates the interface reconfiguration process is detected (**122**-yes), the position(s) of the one or more icons is fixed (**124**). Exemplary predefined user actions include selecting or deselecting a physical button on the portable device, making another predefined gesture on the touch screen display surface, or selecting or deselecting a soft button. The fixed position(s) may correspond to a respective average position(s) for the one or more icons. If a second pre-defined user action that terminates the interface reconfiguration process is not detected (**122**-no), the process may continue when a point of contact proximate to the same or another icon is detected (**116**).

[0035] FIG. **2**A is an illustration of one embodiment of a portable electronic device **200** responsive to touch input for adjustment of the position of one or more icons. The portable electronic device **200** includes a touch-sensitive display with a GUI **210**. The display surface is transparent to allow various graphical objects to be displayed to the user (e.g., widgets). In some embodiments, the GUI **210** is divided into multiple sections or windows. For example, a region **212** of GUI **210** may include a tray **216** for holding icons or graphical objects **222** representing functions that are frequently used by the user (e.g., video, weather, schedule, game, music, etc.) and a tray **214** for holding icons or graphical objects **220** representing functions that are used less frequently by the user (e.g., mail, address book, browser, etc.). The GUI **210** may also include graphical objects corresponding to high-level functions of the portable electronic device **200**. For example, various objects and/or images may be presented and changed in GUI **210** by pressing a menu button **240**. In embodiments that include a mobile phone, dedicated graphical objects can be presented in GUI **210** representing traditional voice and data service operations (e.g., hold, clear, etc.).

[0036] The user may interact with the portable communications device **200** by making contact with the display surface with GUI **210** using a stylus, a finger **218** (not drawn to scale in FIG. **2**) or more than one finger. For example, the user may make contact with the display surface at a position of one of the icons **222** (direct contact), thereby activating the function or application program corresponding to that icon. In some embodiments, the icon **222** is activated when the user makes contact at the position of the icon and then breaks contact (for example, a tapping gesture). In some embodiments, the contact with the display surface used to activate the icon may not be at the position of the icon **222**. Instead, contact may be proximate to the icon **222** (indirect contact). The latter technique is similar to "hot spots" used with Web pages and other computer user interfaces.

[0037] FIGS. **2**B-D show the portable electronic device **200** during the interface reconfiguration mode. After the interface reconfiguration mode is initiated, the display of one or more of the icons **222** in the tray **216** is modified from the previous stationary positions to time-varying positions. As noted previously, the display may include animating one or more of the icons **222** to simulate floating of one or more of the icons **222** on a surface corresponding to the display surface. For example, the animated varying of the positions of one or more of the icons **222** during the interface reconfiguration mode may resemble that of a hockey puck in an air hockey game. The displayed position(s) of a respective icon in the icons **222** may be varied in a region **224** centered on the average position of the respective icon.

[0038] While FIG. **2**B-**2**D illustrates movement of one or more of the icons **222** in the tray **216**, in other embodiments positions of one or more of the icons **220** in another region of GUI **210**, such as tray **214**, may be varied separately or in addition to those of one or more of the icons **222** in tray **216**.

[0039] The time-varying position(s) of one or more of the icons **222** intuitively indicate to the user that the positions of one or more of the icons **222** may be modified. This is illustrated in FIGS. **2**C-D, which show the portable electronic device **200** during the interface reconfiguration mode. The user makes contact, either direct or indirect, with one of the icons that is moving at a position **226** and moves the point of contact across the display surface with GUI **210**. The contact and the motion are detected by the portable electronic device **200**. As a consequence, the displayed icon, in this example corresponding to a game, is moved accordingly.

[0040] As shown in FIG. **2**D, the user moves the game icon to position **228** and breaks contact with the display surface. The game icon is now displayed at the position **228**. While the displayed position of the game icon is shown as stationary in FIG. **2**D, in some embodiments the position of the game icon may be varied once the user breaks contact with the display surface. In some embodiments, only icons displayed in one or more subsections of the GUI **210** are displayed with a varying position during the interface reconfiguration mode. Thus, if the game icon had been dragged to another position in the tray **222**, it may be displayed with a varying position after the user breaks contact with the display. In some embodiments, the device may provide audio and/or tactile feedback when an icon is moved to a new position, such as an audible chime and/or a vibration.

[0041] FIG. **2**D also illustrates the optional displacement of the browser icon to position **230**. The browser icon was displaced from its initial position **228** to its new position **230** due to at least partial overlap with the game icon, i.e., when the portable electronic device **200** determined that the user positioned the game icon over the browser icon, the displayed position of the browser icon was changed.

[0042] In other embodiments, an icon may be evicted or removed from the tray **214** when an additional icon, such as the music icon, is added to the tray **214**. For example, the tray **214** may be configured to accommodate a finite number of icons, such as **4** icons. If an additional icon is added to the tray **214**, a nearest icon to the additional icon or an icon that at least partially overlaps the additional icon may be evicted or removed from the tray **214**. In some embodiments, the evicted icon floats or zooms from its position in tray **214** to a new position in tray **216**, where it may join a sorted list of icons. In some embodiments, if the eviction process is not completed (e.g., the additional icon is not added to tray **214**), the evicted icon may halt its progress towards its new position in tray **216** and return to its position in tray **214**.

[0043] FIG. **2**E illustrates the portable electronic device **200** after the interface reconfiguration mode has been terminated or has terminated (due to a time out). The icons in GUI

210 have stationary positions. The game icon and the browser icon are displayed in their new positions in the tray **214**.

[0044] The animated effects during the interface reconfiguration mode, such as the varying position(s) of one or more of the icons **222**, may be in accordance with corresponding equations of motion for one or more of the icons in a plane substantially coincident with the display surface with GUI **210**. The equations of motion may have a coefficient of friction less than a threshold allowing the simulation and/or animation of floating or sliding of one or more of the icons. The equation of motion for the respective icon may have a non-zero initial velocity, a non-zero angular velocity, and/or a restoring force about the respective average position of the respective icon such that the position of the respective icon oscillates in the region **224** (FIG. **2**D) substantially centered on the respective average position of the respective icon.

[0045] In some embodiments, the position of the respective icon may be varied during the interface reconfiguration mode in such a way that the respective icon rotates about the respective average position of the respective icon while maintaining a fixed orientation with respect to the GUI **210** and the portable electronic device **200**. This is illustrated in FIGS. **3**A and **3**B, which show the portable electronic device **200** during the interface reconfiguration mode. In this example, the position of the video icon **222** in tray **216** is varied in such a way that it maintains a fixed orientation in region **224**. This may make it easier for the user to determine the function of the respective icon during the interface reconfiguration mode.

Portable Electronic Device Architecture

[0046] Attention is now directed towards embodiments of the portable electronic device architecture. FIG. **4** is a block diagram of one embodiment of portable electronic device. A portable electronic device **400** generally includes one or more computer-readable mediums **402**, a processing system **404**, an Input/Output (I/O) subsystem **406**, radio frequency (RF) circuitry **408** and audio circuitry **410**. These components may be coupled by one or more communication buses or signal lines **403**. The device **400** can be any portable electronic device, including but not limited to a handheld computer, a tablet computer, a mobile phone, a media player, personal digital assistant (PDA) and the like, including a combination of two or more of these items.

[0047] It should be apparent that the architecture shown in FIG. **4** is only one example of an architecture for the portable electronic device **400**, and that the device **400** could have more or fewer components than shown, or a different configuration of components. The various components shown in FIG. **4** can be implemented in hardware, software, or a combination of both hardware and software, including one or more signal processing and/or application specific integrated circuits. The RF circuitry **408** is used to send and receive information over a wireless link or network to one or more other devices and includes well-known circuitry for performing this function, including but not limited to an antenna system, an RF transceiver, one or more amplifiers, a tuner, one or more oscillators, a digital signal processor, a CODEC chipset, memory, etc. In some embodiments, the RF circuitry **408** is capable of establishing and maintaining communications with other devices using one or more communications protocols, including but not limited to time division multiple access (TDMA), code division multiple access (CDMA), global system for mobile communications (GSM), Enhanced Data GSM Environment (EDGE), wideband code division multiple access (W-CDMA), Wi-Fi (such as IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and/or IEEE 802.11n), Bluetooth, Wi-MAX, voice over Internet Protocol (VoIP), a protocol for email, instant messaging, and/or a short message service (SMS), or any other suitable communication protocol, including communication protocols not yet developed as of the filing date of this document.

[0048] The RF circuitry **408** and the audio circuitry **410** are coupled to the processing system **404** via the peripherals interface **416**. The interface **416** includes various known components for establishing and maintaining communication between peripherals and the processing system **404**. The audio circuitry **410** is coupled to anaudio speaker **450** and a microphone **452** and includes known circuitry for processing voice signals received from interface **416** to enable a user to communicate in real-time with other users. In some embodiments, the audio circuitry **410** includes a headphone jack (not shown). Voice and data information received by the RF circuitry **408** and the audio circuitry **410** (e.g., in speech recognition or voice command applications) is sent to one or more processors **418** via the peripherals interface **416**. The one or more processors **418** are configurable to process various data formats for one or more applications programs **430** stored on the medium **402**.

[0049] Note that the term "data" includes but is not limited to text, graphics, Web pages, JAVA applets, widgets, emails, instant messages, voice, digital images or video, widgets, MP3s, etc., which can be used by one or more applications programs **430** stored on the medium **402** (e.g., Web browser, email, etc.). In some embodiments, the device **400** is capable of uploading and downloading various data from the Internet over a wireless network or an external port **436**, such as files, songs, digital images, videos, emails, widgets, instant messages and the like.

[0050] The peripherals interface **416** couples the input and output peripherals of the device to the processor **418** and the computer-readable medium **402**. The one or more processors **418** communicate with the one or more computer-readable mediums **402** via a controller **420**. The computer-readable medium **402** can be any device or medium that can store code and/or data for use by the one or more processors **418**. The medium **402** can include a memory hierarchy, including but not limited to cache, main memory and secondary memory. The memory hierarchy can be implemented using any combination of RAM (e.g., SRAM, DRAM, DDRAM), ROM, FLASH, magnetic and/or optical storage devices, such as disk drives, magnetic tape, CDs (compact disks) and DVDs (digital video discs). The medium **402** may also include a transmission medium for carrying information-bearing signals indicative of computer instructions or data (with or without a carrier wave upon which the signals are modulated). For example, the transmission medium may include a communications network, including but not limited to the Internet (also referred to as the World Wide Web), intranet(s), Local Area Networks (LANs), Wide Local Area Networks (WLANs), Storage Area Networks (SANs), Metropolitan Area Networks (MAN) and the like.

[0051] The one or more processors **418** run various software components stored in the medium **402** to perform various functions for the device **400**. In some embodiments, the software components include an operating system **422**, a communication module (or set of instructions) **424**, a contact/motion module (or set of instructions) **426**, a graphics module (or set of instructions) **428**, one or more applications (or set of

instructions) **430**, a timer module (or set of instructions) **438** and a reconfiguration module (or set of instructions) **440**.

[0052] The operating system **422** (e.g., Darwin, RTXC, LINUX, UNIX, OS X, WINDOWS, or an embedded operating system such as VxWorks) includes various procedures, sets of instructions, software components and/or drivers for controlling and managing general system tasks (e.g., memory management, storage device control, power management, etc.) and facilitates communication between various hardware and software components.

[0053] The communication module **424** facilitates communication with other devices over one or more external ports **436** or via RF circuitry **408** and includes various software components for handling data received from the RF circuitry **408** and/or the external port **436**. The external port **436** (e.g., USB, FireWire™, etc.) is adapted for coupling directly to other devices or indirectly over a network (e.g., the Internet, wireless LAN, etc.).

[0054] The graphics module **428** includes various known software components for rendering, animating and displaying graphical objects on a display surface of a touch-sensitive display system **412**. Note that the term "graphical object" includes any object that can be displayed to a user, including without limitation text, web pages, icons, digital images, animations and the like.

[0055] The one or more applications **430** can include any applications installed on the device **400**, including without limitation, a browser, address book, contact list, email, instant messaging, word processing, keyboard emulation, widgets, JAVA-enabled applications, encryption, digital rights management, voice recognition, voice replication, location determination capability (such as that provided by the global positioning system (GPS)), a music player (which plays back recorded music stored in one or more files, such as MP3 or AAC files), etc.

[0056] In some embodiments, the device **400** may include the functionality of an MP3 player, such as an iPod (trademark of Apple Computer, Inc.). The device **400** may, therefore, include a 36-pin connector that is compatible with the iPod. In some embodiments, the device **400** may include one or more optional optical sensors (not shown), such as CMOS or CCD image sensors, for use in imaging applications.

[0057] The contact/motion module **426** includes various software components for performing various tasks associated with the touch-sensitive display system **412**, as previously described with respect to the embodiments in FIGS. **1-3**.

[0058] The timer module **438** is a software timer used with the interface reconfiguration process **100** (FIG. **1**). The timer module **438** can also be implemented in hardware.

[0059] The reconfiguration module **440** may include an icon effects module (or a set of instructions) **442**. The icon effects module **442** may include animation for the icons during the interface reconfiguration mode. In some embodiments, the icon effects module **442** may be included in the graphics module **428**.

[0060] The I/O subsystem **406** is coupled to the touch-sensitive display system **412** and one or more other physical control devices **414** (e.g., pushbuttons, switches, dials, LEDs, etc.) for controlling or performing various functions, such as power control, speaker volume control, ring tone loudness, keyboard input, scrolling, hold, menu, screen lock, clearing and ending communications and the like. The touch-sensitive display **412** communicates with the processing system **404** via the touch sensitive screen controller **432**, which includes various components for processing user input (e.g., scanning hardware). The one or more other input controllers **434** receives/sends electrical signals from/to the other input or control devices **414**. The other input/control devices **414** may include physical buttons (e.g., push buttons, rocker buttons, etc.), dials, slider switches, sticks, and so forth.

[0061] The touch-sensitive display **412** displays visual output to the user in a GUI. The visual output may include text, graphics, video, and any combination thereof. Some or all of the visual output may correspond to user-interface objects. The touch-sensitive display **412** may also accept input from the user based on haptic and/or tactile contact. The touch-sensitive display **412** forms a touch-sensitive surface that accepts user input. The touch-sensitive display **412** and the touch screen controller **432** (along with any associated modules and/or sets of instructions in the medium **402**) detects contact (and any movement or release of the contact) on the touch-sensitive display **412** and converts the detected contact into interaction with user-interface objects, such as one or more soft keys, that are displayed on the touch screen when the contact occurs. In an exemplary embodiment, a point of contact between the touch-sensitive display **412** and the user corresponds to one or more digits of the user. The touch-sensitive display **412** may use LCD (liquid crystal display) technology, or LPD (light emitting polymer display) technology, although other display technologies may be used in other embodiments. The touch-sensitive display **412** and touch screen controller **432** may detect contact and any movement or release thereof using any of a plurality of touch sensitivity technologies, including but not limited to capacitive, resistive, infrared, and surface acoustic wave technologies, as well as other proximity sensor arrays or other elements for determining one or more points of contact with the touch-sensitive display **412**.

[0062] The touch-sensitive display may be analogous to the multi-touch sensitive tablets described in the following U.S. Pat. No. 6,323,846 (Westerman et al.), U.S. Pat. No. 6,570,557 (Westerman et al.), and/or **6,677,932** (Westerman), and/or U.S. Patent Publication 2002/0015024A1, each of which is hereby incorporated by reference. However, the touch screen **126** displays visual output from the portable device, whereas touch sensitive tablets do not provide visual output. The touch-sensitive display **412** may have a resolution in excess of 100 dpi. In an exemplary embodiment, the touch-sensitive display **412** may have a resolution of approximately 168 dpi. The user may make contact with the touch-sensitive display **412** using any suitable object or appendage, such as a stylus, pen, finger, and so forth.

[0063] In some embodiments, in addition to the touch screen, the device **400** may include a touchpad (not shown) for activating or deactivating particular functions. In some embodiments, the touchpad is a touch-sensitive area of the device that, unlike the touch screen, does not display visual output. The touchpad may be a touch-sensitive surface that is separate from the touch-sensitive display **412** or an extension of the touch-sensitive surface formed by the touch-sensitive display **412**.

[0064] The device **400** also includes a power system **444** for powering the various hardware components. The power system **444** can include a power management system, one or more power sources (e.g., battery, alternating current (AC)), a recharging system, a power failure detection circuit, a power converter or inverter, a power status indicator (e.g., a light

emitting diode (LED)) and any other components typically associated with the generation, management and distribution of power in portable devices.

[0065] In some embodiments, the peripherals interface **416**, the one or more processors **418**, and the memory controller **420** may be implemented on a single chip, such as the processing system **404**. In some other embodiments, they may be implemented on separate chips.

[0066] The foregoing descriptions of specific embodiments of the present invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed. Rather, it should be appreciated that many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, to thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated.

What is claimed is:

1 A portable electronic device, comprising:

a touch-sensitive display;

one or more processors;

memory; and

one or more programs, wherein the one or more programs are stored in the memory and configured to be executed by the one or more processors, the programs including:

instructions for displaying a first plurality of icons in a first region on the touch-sensitive display;

instructions for detecting a first predefined user action, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and

instructions for varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons.

2. The device of claim **1**, wherein the instructions for varying positions include instructions for animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

3. The device of claim **1**, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

4. The device of claim **1**, further comprising

instructions for detecting a user making a point of contact with the touch-sensitive display at a first position corresponding to a first icon in the multiple icons and instructions for detecting movement of the point of contact to a second position of the touch-sensitive display; and

instructions for responding to detecting the point of contact and detecting movement of the point of contact by displaying movement of the first icon to the second position of the touch-sensitive display and displaying the first icon at the second position.

5. The device of claim **4**, further comprising instructions for fixing a position of the first icon at the second position in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguring process.

6. The device of claim **4**, further comprising instructions for moving a second icon in the multiple icons from a respective initial position to a respective new position when the second position of the first icon at least partially overlaps with the respective initial position of the second icon.

7. The device of claim **1**, further comprising

instructions for detecting a user making a first point of contact with the touch-sensitive display at a first position corresponding to a first icon in the multiple icons and instructions for detecting movement of the first point of contact to a second position in a second region on the touch-sensitive display; and

instructions for responding to detecting the first point of contact and detecting movement of the first point of contact by displaying movement of the first icon to the second position of the touch-sensitive display and displaying the first icon at the second position.

8. The device of claim **7**, further comprising

instructions for detecting a user making a second point of contact with the touch-sensitive display at a third position corresponding to a second icon in a second plurality of icons in the second region on the touch-sensitive display and instructions for detecting movement of the second point of contact to a fourth position in the first region on the touch-sensitive display; and

instructions for responding to detecting the second point of contact and detecting movement of the second point of contact by displaying movement of the second icon to the fourth position of the touch-sensitive display and displaying the second icon at the fourth position.

9. The device of claim **8**, further comprising instructions for fixing a position of the first icon at the second position and a position of the second icon at the fourth position in response to detecting a second predefined user action, with respect to the touch-sensitive display, for terminating the predefined user interface reconfiguration process.

10. The device of claim **7**, further comprising instructions for moving a third icon in the second plurality of icons from a respective initial position to a respective new position when the new position of the first icon at least partially overlaps with the respective initial position of the third icon.

11. A computer program product with instructions configured for execution by one or more processors, which when executed by a portable electronic device with a touch-sensitive display, cause the device to:

display a first plurality of icons in a first region on the touch-sensitive display;

detect a first predefined user action, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and

vary positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons.

12. The computer program product of claim **11**, wherein varying positions includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

13. The computer program product of claim **11**, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

14. The computer program product of claim **11**, further comprising instructions configured for execution by the one or more processors, which when executed by the electronic device with the touch-sensitive display, cause the device to:

detect a user making a point of contact with the touch-sensitive display at a first position corresponding to a first icon in the multiple icons and detect movement of the point of contact to a second position of the touch-sensitive display; and

respond to detecting the point of contact and detecting movement of the point of contact by displaying movement of the first icon to the second position of the touch-sensitive display and displaying the first icon at the second position.

15. The computer program product of claim **14**, further comprising instructions configured for execution by the one or more processors, which when executed by the electronic device with the touch-sensitive display, cause the device to move a second icon in the multiple icons from a respective initial position to a respective new position when the second position of the first icon at least partially overlaps with the respective initial position of the second icon.

16. A graphical user interface on a portable electronic device with a touch-sensitive display, comprising:

a first plurality of icons displayed in a first region on the touch-sensitive display,

wherein:

a first predefined user action is detected, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and

positions of multiple icons of the first plurality of icons are varied in response to detecting the first predefined user action, wherein the varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons.

17. The graphical user interface of claim **16**, wherein the varying positions of multiple icons includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

18. The graphical user interface of claim **16**, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

19. The graphical user interface of claim **16**, further comprising

a user making a point of contact with the touch-sensitive display is detected at a first position corresponding to a first icon in the multiple icons and movement of the point of contact to a second position of the touch-sensitive display is detected; and

in response to detecting the point of contact and detecting movement of the point of contact, movement of the first icon to the second position of the touch-sensitive display is displayed and the first icon is displayed at the second position.

20. The graphical user interface of claim **19**, further comprising a second icon in the multiple icons is moved from a respective initial position to a respective new position when the second position of the first icon at least partially overlaps with the respective initial position of the second icon.

21. A computer-implemented method, comprising:

at a portable electronic device with a touch-sensitive display:

displaying a first plurality of icons in a first region on the touch-sensitive display;

detecting a first predefined user action, with respect to the touch-sensitive display, for initiating a predefined user interface reconfiguration process; and

varying positions of multiple icons of the first plurality of icons in response to detecting the first predefined user action, wherein the varying includes varying the positions of each icon of the multiple icons about a respective average position distinct from the respective average positions of other icons of the multiple icons.

22. The computer-implemented method of claim **21**, wherein the varying includes animating the multiple icons to simulate floating of the multiple icons on a surface corresponding to a surface of the touch-sensitive display.

23. The computer-implemented method of claim **21**, wherein each respective icon of the multiple icons has a time varying position in a region substantially centered on the respective average position of the respective icon.

24. The computer-implemented method of claim **21**, further comprising

detecting a user making a point of contact with the touch-sensitive display at a first position corresponding to a first icon in the multiple icons and detecting movement of the point of contact to a second position of the touch-sensitive display; and

responding to detecting the point of contact and detecting movement of the point of contact by displaying movement of the first icon to the second position of the touch-sensitive display and displaying the first icon at the second position.

25. The computer-implemented method of claim **24**, further comprising moving a second icon in the multiple icons from a respective initial position to a respective new position when the second position of the first icon at least partially overlaps with the respective initial position of the second icon.

* * * * *

CERTIFICATE OF SERVICE

I hereby certify that I electronically filed the foregoing with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit by using the appellate CM/ECF system on November 2, 2015.

I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the appellate CM/ECF system.

November 2, 2015

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CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B)(i) because this brief contains 10,243 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Word 2013 in Century Schoolbook 14-point font.

November 2, 2015

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